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ORIGINAL ARTICLES.

OPIATES IN ACUTE PERITONITIS.[1]

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PROF. ALONZO CLARK, in his article on "Peritonitis," in the *System of Practical Medicine*, makes the following statement:

"In 1840 there was a very fatal visitation of puerperal fever in this (Bellevue) hospital. . . . I was a daily visitor and took notes of all the cases. . . . The disease was fearfully fatal, although every known mode of treatment was tried in different cases . . . but, although with one or two exceptions, with the same result. At this time the opium plan was on its trial, and I had not acquired a confidence in it that authorized me to try it in these cases. The time for it came in 1851. Then a sudden, vigorous attack occurred. One woman was sent to me in whom the disease was well advanced; I instructed my house-physician not how much opium to give, but what effects to produce by it. I found this woman dying the next day, and that she had taken only three grains of opium in three doses. In three or four days seven cases were sent me from the lying-in wards. One was returned for error in diagnosis, and six put under treatment. Having found that prudence in my house-physician was so much more conspicuous than courage, another house-officer, who combined them both, was selected to be in almost constant attendance. The instruction was in these words: 'I want you to narcotize those women to within an inch of their lives.' He did it and saved every one of them. This gentleman is now known over the whole land as a learned and distinguished surgeon. I feel called upon to give his name in this connection that he may be a witness to the facts I state, and for the admiration with which his nerve and prudence impressed me."

It is an interesting fact that Prof. Clark failed to give the name of the gentleman whom he so highly complimented, and whom he thus publicly called to witness to the truth of his statement. As I was then a resident student in Bellevue Hospital and had the care of the six cases to which he alludes, I assume that I am the person referred to, and will take this occasion to bear witness to the facts which Prof. Clark brought forward in his paper.

At the period mentioned by Prof. Clark, Bellevue was a hospital only in name. The buildings were erected in the early part of the century, 1811–16, for prison and almshouse purposes. They were chiefly built on grounds reclaimed from the river, and without under-drainage or adequate sewerage. The buildings were very massive in construction and, in the prison style of that day, without a pretence of ventilation. For a quarter of a century, Bellevue was little else than a prison and a pesthouse. All forms of contagious and infectious diseases were received into its crowded and illy ventilated wards. At various times, yellow fever, typhus and typhoid fevers, smallpox and cholera have been the prevailing diseases of its inmates.

The evolution of this establishment into a hospital was a very slow process. The prisoners were first removed to the Island, and gradually all of the able-bodied paupers were provided with quarters in the new almshouse. In time, only the sick poor were detained at Bellevue, and the institution assumed the general character of a hospital.

In 1840, the date to which Prof. Clark first alludes, the hospital had a resident physician, who was the sole responsible authority in managing its general and medical affairs. The appointment was purely political and the government was of the same character. In 1846–7 there came a complete change in the administration of the institution by the selection of a competent medical board and the final retirement of resident physicians. From this latter date, Bellevue as an organized hospital dates its origin. There was, however, comparatively little improvement in the sanitary condition of the hospital buildings for many years. Gradually better ventilation was secured, and the general cleanliness of the wards and beds was improved. The maternity wards of Bellevue were at this early date in the same condition as the other wards. They were not specially separated from the others, except that they were situated at the extreme end of one of the wings. The number of confinements usually averaged one daily, though they occasionally reached the number of sixty in a month.

Puerperal fever was the great scourge of the hospital at that period. Whenever it appeared, nothing seemed to control its progress, and no treatment saved its victims from speedy death. These facts are confirmed by referring to the outbreak in 1840, attended to by Prof. Clark, and reported by Dr. Vaché, the resident physician. He states that the disease made its appearance on the 12th of January, 1840, and was quickly followed by two more cases, apparently so malignant that it was immediately determined to vacate the room, with a view to its purification. The inmates were accordingly re-

[1] Address delivered at the annual meeting of the Fifth or Southern District Medical Association, held in Brooklyn, New York, May 26, 1891.

moved and the apartment whitewashed, ventilated and scrubbed; the bedsteads were cleansed, new beds and bedding introduced, and at the expiration of about a week it was considered sufficiently disinfected to return to it in safety; but the disease immediately reappeared, equally as violent and irremediable as before, and it was concluded most judicious to abandon the building. As promptly as it could be accomplished, another, some distance from the almshouse and appropriated for a nursery, was put in the most perfect order; the bedsteads were cleansed and painted, new beds and bedding were furnished; the physician and nurse were changed; the pregnant women were directed to cleanse their persons by bathing; new clothes, even shoes, were given to them, immediately prior to transferring them to their new habitation, and all intercourse with the inmates of the surrounding premises arrested. Notwithstanding these precautions, the first woman confined, and subsequently four others in succession out of five labors were attacked with the disease, which in every case was fatal. As a further effort in the cause of human life, and as the only rational means of arresting this terrible scourge, came the total abandonment of the lying-in establishment at Bellevue.

To the earlier resident medical students of Bellevue Hospital this sketch presents a graphic but familiar picture of an outbreak of puerperal fever in that institution in the years 1840–57. Cleanliness and isolation of patient and physician were the chief preventive measures employed, but they were powerless to control the spread of the disease. The mortality reported by Vaché was appalling. Of twenty-one cases, nineteen, or over 90 per cent., proved fatal. Nor was this death-rate unusual, as we learn from other sources.

It is important to notice the pathological conditions which were found to exist in the fatal cases. Careful autopsies were made in seventeen of these. The records of these autopsies, as published by Dr. Vaché, were made by Prof. Clark, for he states that he was a daily visitor and took notes of all the cases, and that it was from these notes that Vaché compiled his report of the epidemic. In sixteen of the seventeen cases examined post-mortem, there was, according to these notes, peritonitis. In these cases, there was effusion into the peritoneal cavity which is variously described as "sero-purulent" and "sero-lymphatic." In all seventeen, the uterus was examined and the pathological changes reported. In two cases this organ appeared to be without any special change. In the remaining cases, the alterations were those due apparently to metritis. In several, there were putrefactive changes of matters within the cavity, as the remains of the placenta and the natural discharges after child-birth. The following is an example: The cavity of the uterus was covered, from the fundus down to the cervix, with a dark-chocolate, stringy, fœtid substance, which was easily scraped off with the knife, showing the surface beneath injected; the cervix was covered with a firmly-adherent substance, of a greenish-gray color, with spots of white; the os uteri was of a dark-purple color; beneath the peritoneal surface of the uterus there was much lymph deposited. In several instances pus was found in the ovaries and Fallopian tubes. Pus was also found collected in considerable quantity between the uterus and bladder. In one case, many peritoneal bands had formed, binding the viscera together; an abscess, four inches in diameter, separated the peritoneum from the walls of the abdomen; the sub-peritoneal cellular tissue of the pelvis, extending nearly to the kidney, resembled lint soaked in pus; numerous deposits of pus were found under the peritoneal covering of the uterus, in the broad ligaments, ovaries and Fallopian tubes; the left internal iliac vein was occluded by a firm clot, which extended into the gluteal, ischiatic and obturator branches; in the clot were found collections of pus. The records of these autopsies were more or less accurately reported on every recurrence of puerperal fever at Bellevue Hospital between the years 1840 and 1851. They may undoubtedly be taken as illustrating the ordinary form of puerperal peritonitis when that disease prevailed in this hospital.

It is important also to notice the treatment of these cases, which is given in considerable detail. Of the two cases which recovered, in one the principal treatment was saline cathartics, wet cups to the abdomen, and opiates; and in the other, venesection and leeches to the abdomen. Of the fatal cases, four were treated with saline cathartics and venesection chiefly; in eight, calomel in scruple doses was given, combined with venesection and leeches; in ten, venesection was the more important element in treatment, combined in five cases with leeches; in five cases, turpentine as a cathartic was largely employed. In one, large doses of cinchona bark were used, as recommended by Dr. Burns, and later, turpentine as a purgative. It will be seen that the treatment was so mixed that it would be difficult to draw any conclusions as to the efficacy of any one remedy. Still it is noticeable that purgatives were actively and efficiently employed in seventeen of the twenty-one cases, and that in five cases the cathartic was salts. In the other cases, calomel and turpentine, two approved antiseptic remedies, were administered freely. Opiates, in the form of opium and Dover's powder, were given in most cases, but in small and occasional quantities.

This review of the outbreak of puerperal fever in

1840 may be regarded as fairly illustrating the average features of the recurring appearances of that scourge in the lying-in wards of Bellevue Hospital prior to the year 1851. Prof. Clark truly says: "Up to the time when the opium treatment was adopted, peritonitis was a fearful word; a large proportion of those attacked by it died of it." I was one of the resident staff of surgeons of Bellevue Hospital in 1851, and well remember the excitement created when the first case of puerperal fever was announced. To the visiting staff it meant a hopeless struggle with a virulent pestilence; and to the resident staff, the loss of the obstetric service, which was highly prized. Prof. Clark had already, in his lectures, and especially in the Pathological Society, advanced the opinion that opium might prove to be a successful remedy in peritonitis. He related his experience in cases which he saw in consultation with physicians in Vermont, where he lectured during the autumn months. He says in regard to this experience:

"I found that they were treating the disease on the Armstrong plan; that is, bleeding freely and then administering a full dose of opium, as they said, 'to prolong the effects of the bleeding.' In most cases there was a second bleeding and a second administration of opium. . . . I found they were getting better results than we were in New York, and I studied their cases as closely as I could, and reached the conclusion that opium was the curative agent and that it would be safe to omit the abstraction of blood. This conviction grew in strength with every new case, and I saw, with different physicians, several cases. . . . The idea then formed was that to establish the narcotic effects of opium within safe limits, and continue them by repeated administrations of the drug, would cure uncomplicated peritonitis—that a kind of saturation of the system with opium would be inconsistent with the progress of the inflammation and would subdue it. There was no theory to build the treatment on and no explanation of the action of the drug in my mind. What I saw of the action of two full doses of opium was the only foundation for the idea."

The first case of puerperal fever in the outbreak of 1851, in Bellevue, resembled in all of its peculiarities those of previous epidemics. The onset was violent, the symptoms characteristic, and the termination rapidly fatal. The patient was early transferred to Dr. Clark's wards, and there were great anticipations of the success of the opium treatment. The uninterrupted progress of the disease to its fatal termination, in spite of the opium administered, produced a very unfavorable impression upon the visiting physicians as to the alleged value of this remedy. Dr. Clark, however, declared that the opium had not been fairly tested, for it was found that the drug had been given in such very small quantities that no such effects could have been obtained as he intended and desired. Prof. Clark says:

"The drug symptoms to be produced are subsidence or marked diminution of the pain; some or considerable tendency to sleep; contraction of the pupils; reduction of the breathing to twelve respirations in the minute; in the favorable cases a considerable reduction in the frequency of the pulse; a gentle perspiration; an itchy state of skin, or oftener of the nose; absolute inactivity of the bowels, and after a time a subsidence of the tremor and tenderness in them; some suffusion of the eyes."

Three new cases were soon after transferred to Dr. Clark's care, then two more, and then one, making six in all. They occupied a separate ward, and Dr. Clark determined to make a thorough test of the opium treatment. Special nurses were provided, and I was selected as the immediate medical attendant. His instructions were very explicit. He required that I should aim to see the patients every hour; should closely watch the pulse and respiration, and personally see that the medicine was regularly given. In regard to the opium, he stated that I must not be governed at all by the amount administered, but by the effects. The condition of the patient to be secured was that of semi-narcotism; this was to be determined by the degree of stupor and the respiration; the patient must require to be shaken to arouse her to consciousness, and the respirations might fall to twelve per minute, but not below that figure. In concluding his instructions, he inquired if I had ever heard the schoolmaster say, "I will whip you to within an inch of your life?" On being assured that I was familiar with the expression, he said, "I wish you to give these patients opium to within an inch of their lives." Prof. Clark thus describes the method of medication:

"The plan is to begin with a dose that is safe—say two or three grains of opium or its equivalent of sulphate of morphia, and in two hours notice its effects. If any of the opium symptoms have appeared, repeat the dose; if none, increase by one grain, and so on at intervals of two hours till the degree of tolerance in the patient is ascertained. After that the case can be treated by a diminished occupation of the physician's time—two or three visits a day. The dose is to be increased if the opium symptoms diminish before the disease yields, but always to be diminished or discontinued if narcotism is approaching. The duration of the treatment will be sometimes no more than two or three days; it may be a week, or even a fortnight, and in one case the symptoms persisted mildly for forty days, and then yielded. In this case the medicine used was the sulphate of morphia, and the enormous dose reached by steady and graduated increase was one grain and a quarter every forty minutes in a boy ten years old."

The treatment was immediately begun. The opiates were given in the form of morphine, solid opium and laudanum, but the quantity of each was accurately determined by the apothecary and estimated in grains of opium. At the outset, each patient received one grain of opium every hour, for three doses. No effect being perceptible, the dose was increased to two grains every hour and con-

tinued for three doses. Failing with this dosage, the opium was increased to three grains every hour. In four cases, this amount of opium had the desired effect, and it was continued at that rate. In the remaining cases it had to be increased to four grains every hour. One of these remaining cases yielded to this amount and the opiate was continued at that rate. The other, or sixth case, was much more obstinate, and the opium was steadily increased until the dose reached twelve grains every hour. This amount simply secured a light but continuous sleep, from which she readily awoke on placing the hand upon her wrist to examine her pulse. The first four cases continued to receive three grains of opium every hour for some two or three days, when the pulse fell to its normal standard, the tympanites subsided, the tenderness of the abdomen disappeared, and the patients were evidently convalescent. The opium was discontinued; they rapidly recovered, and remained well. In the fifth case, an episode occurred which Dr. Clark mentions, but not accurately. The patient was a tall, young woman, having a pale and somewhat cadaverous face. On the fourth night, while the four-grain doses of opium were being given, the nurse failed to call me at the usual hour and I overslept two hours. On awakening and noticing the time that had elapsed I hastened to the ward. The nurse was sleeping soundly in her chair. The patients were all sleeping quietly, and were apparently doing well, except the fifth. On approaching her bedside, I was struck with her death-like pallor, heightened by the feeble light of a candle on an opposite shelf, her half-opened eyes, her fallen jaw, and absence of pulse. I stood a moment, quite paralyzed at the thought of my neglect and that of the nurse, when I noticed that she gasped. There was an interval, and then another gasp. I counted those efforts at respiration, and found that the fourth occurred just after the minute had expired. I at once aroused the nurse and took active measures to recover the patient from her profound narcotism. After several hours' continuous effort, she was regarded as securely restored. All the symptoms of peritonitis had meantime subsided; the pulse had fallen from 112 to 92 per minute, the tympanites and tenderness had disappeared, and she expressed herself as feeling well. Within twenty-four hours all the symptoms of peritonitis recurred, and the treatment was renewed, three grains of opium being given instead of four. Semi-narcotism was readily produced, and after a very brief period the symptoms again subsided; the treatment was suspended, and she remained permanently cured.

The following notes of one of these cases, contributed by Dr. Clark to Keating's edition of *Ramsbotham's System of Obstetrics*, illustrates the symptoms and progress of the disease while under treatment:

A. N., aged twenty years, married, delivered of her first child October 1, 1851. The labor was natural and of usual duration. Convalescence was not attended by any untoward symptom except a slight diarrhœa. . . . On the tenth day after confinement she was seized with a chill at 10 o'clock A.M.; chill lasted an hour; the abdomen was markedly tympanitic, extremely tender, and the seat of lancinating pains which caused sobbing; pulse 120; respiration thoracic; tongue clean. Ordered solution sulph. morph. (seventeen grains to one ounce of water), ten minims every hour. She slept most of the day and succeeding night quietly, but not profoundly.

Second day; 10 o'clock. Tympanites increased; tenderness somewhat diminished; extreme thirst; occasional vomiting of a bright-green fluid; bowels quiet; lochia had ceased previous to attack; pulse 120. Other symptoms as before. It was obvious that not much impression had been made on the disease in the first twenty-four hours, and the solution was given (ten minims) every half-hour. This produced sleep, and by evening the pulse had fallen to 90.

Third day. Tympanites and thirst continue; retention of urine; intellect rather obtuse. Other symptoms as before. The morphine solution was now increased to thirty minims every hour. These doses were continued from noon till six or seven o'clock in the evening, when the signs of narcotism became rather alarming. She slept heavily; was roused with difficulty; would not reply to qustions; pupil contracted almost to a point; pulse 68 and respiration seven in the minute. The opiate was suspended, and tablespoonful doses of strong coffee administered. The narcotism continued for six or seven hours, and gradually subsided.

Fourth day. Tympanites diminished; tenderness markedly less; features composed; intellect rather dull; pulse 78; tongue dry in the centre; green vomiting occasionally; slight hysterical symptoms; respiration 15. Morph. sol. resumed, ten minims every half-hour. Narcotism recurred at about the same hour as last evening, in which the sleep was very profound and the respiration only five in the minute. Treatment as on the previous evening. Toward morning these unpleasant effects of the medicine passed off.

Fifth day. The tongue was dry and slightly brown, but patient declares that she feels quite well; tympanites has nearly disappeared; no pain nor tenderness; pulse 80 and respiration 15; some appetite. . . . At 11 A.M. morph. sol. resumed, ten minims every two hours. At night, wakefulness and pain in the abdomen; three grains of opium every hour, under the influence of which she slept quietly.

Sixth day. Sleeps most of the time; easily roused, but answers questions slowly and with an effort; tongue moist, and not furred; tenderness that recurred last night less; pulse 80; still vomits green fluid; treatment continued.

Seventh day. Symptoms all improved; one grain of opium every hour.

Eighth day. Abdomen soft and free from pain or tenderness; thirst slight; says, "I feel so much better;" was decidedly convalescent. From this time the opium was continued in gradually diminished doses. The bowels were not opened until the thirteenth day; after this, treatment was discontinued, and she was discharged in a few days in her usual health.

The sixth case proved to be an anomaly in the tolerance of opiates. During ten days the treatment was persevered in, the pulse remaining at about 120, the respirations 34 to 36, the abdomen greatly

distended and tender to the touch, with lancinating pains, the features pinched, perspiration at intervals, etc. During these twelve days, this patient took the equivalent of 1950 grains of opium, and she neither vomited during that time nor did she have an evacuation of her bowels. No effort was made to secure an evacuation of the bowels during the opium treatment.

"Purgatives are entirely inadmissible. The bowels should be left entirely at rest till they recover their muscular tone; then they will expel first the gas and then the fæces; or if, after the inflammation is subdued, they do not move of their own accord, injections are admissible. I have often left the bowels absolutely inactive for fourteen days without any recognizable consequences."—PROF. CLARK.

At no time was the patient so narcotized that she did not awaken when anyone placed a hand on her wrist. She remained in the hospital as an assistant in the laundry for six months after her recovery, and during that time she was in excellent health. The following extract from the records shows the course of treatment of this patient:

"The treatment was commenced at 10 A.M. with two grains of opium hourly; at 2 P.M. dose increased to four grains; at 3, four grains; at 4, five grains; at 5, five grains; at 6, eight grains; at 8, ten grains; at 9, twelve grains; at 11, sol. morph. sulph. one and a half drachms; at 12, one drachm; at 1.30 A.M. respirations 6; at 6 A.M. respirations 12, twelve grains of opium; at 10, sol. one drachm; at 12 M., opium, twelve grains; at 1.30 P.M., sol. two drachms; at 2.30, two drachms; at 3.30, opium, twenty-four grains; at 5, twelve grains; at 6.30, sol. two and a half drachms; at 7.30, two drachms; at 9, opium, fourteen grains; at 10, sixteen grains; at 11, seventeen grains; at 1 A.M., sol. two and a half drachms; at 2, sol. four drachms; at 3.30, opium, twenty grains; at 4, sol. two and a half drachms; at 5, three drachms; at 6, three and a half; at 6.30, opium, ten grains; at 7, sol. three and a half drachms; at 8, opium, twenty-two grains; at 9.30 sol., four drachms; at 10, sol. three drachms; at 11.30, three drachms. On one day she took the equivalent of 472 grains of opium."

Such is my testimony to the facts which Prof. Clark gives in his articles. Subsequently I had abundant opportunities to witness the opium treatment of peritonitis, both puerperal, traumatic and idiopathic. The recovery of these six consecutive cases very naturally produced a profound impression upon the resident and visiting physicians of Bellevue. As the cases were all typical of those ordinarily occurring at that hospital, and as opiates were the sole remedies employed in their treatment, it was apparent that a new era in the therapeutics of this scourge had begun. From this time forward opium continued for twenty years to be the chief remedy employed in peritonitis in Bellevue Hospital, and with satisfactory results. Opium in peritonitis came into general use in the city. Prof. Clark states that "in private practice the drug has been perhaps more curative than in the hospital." He adds: "I have seen many cases in consultation, and a decided majority have recovered."

It is apparent from the preceding review that previously to the introduction of the opium treatment, puerperal peritonitis was a most destructive disease in Bellevue Hospital when treated by the methods employed prior to 1851. With the introduction of opium, employed as the chief remedy, and in the manner directed by Dr. Clark, the same disease, occurring under the same circumstances, became so manageable that a mortality of 90 per cent. was reduced certainly 50 per cent. These facts lead inevitably to the conclusion that the opium treatment of peritonitis has a place in the therapeutics of that affection of no small importance. Precisely what that position is, it is, perhaps, still impossible to state. Prof. Clark remarks that he cannot explain the curative action of opium in peritonitis. Prof. Barker, who has had a large and varied experience in the treatment of puerperal peritonitis in Bellevue, speaking of the same question, says:

"The most important of all agents in controlling and arresting this disease is opium in some form. Let us see what we gain by its use. The peristaltic movements are retarded or arrested, and thus the inflamed tissues have absolute rest; pain is annulled; emotional excitement is allayed; the nervous system is tranquillized; sleep is secured; and thus the depression of the vital forces resulting from the shock of the attack is lessened."

Prof. Clark regarded opium as valuable chiefly in simple, uncomplicated peritonitis. He says:

"When the inflammation of the uterus is the dominant lesion, and is purulent, opium has little or perhaps no control over its fatality; but in the cases in which peritonitis is the ruling lesion, if begun early, it will show its power."

And yet the preceding history of the six puerperal cases which recovered resembled in all their essential peculiarities the fatal cases reported by Vaché, in many of which the inflammation of the uterus and its appendages was the dominant lesion. Of course, we cannot positively assert that the cases which recovered had other lesions than those of the peritoneum, but six consecutive cases of peritonitis in the lying-in wards of Bellevue Hospital without any inflammatory changes of the uterus and its appendages would, at the period under review, have been regarded as impossible. Especially would this be true in an outbreak the first case in which rapidly proved fatal with such complications. We would seem, therefore, to be justified in the conclusion that several cases made a satisfactory recovery at that time in which the inflammation of the uterus and appendages was the dominant lesion.

Happily, in these latter days antisepticism has greatly diminished the frequency of this formidable disease, especially the puerperal form, and in the

meantime the remedial measures have been markedly increased. This improvement is due to a more accurate knowledge of the functions of the peritoneum and of the existence and action of pyogenic organisms. The researches of Wegner, Grawitz and Pawlowsky have determined that the peritoneum is quite tolerant of simple wounds which heal readily. As a lymph-sac, the stomata in its walls opening into the surrounding lymphatics, the peritoneum is almost directly connected with the spleen, pleura and other organs, thus admitting of rapid general infection by peritonitic microbes when they exist in large quantities. The healthy peritoneum is not sensitive to injected fluids, provided they do not contain putrefactive bacteria, but even these organisms may be injected in small quantities, without harm, as they are quickly absorbed and destroyed or excreted; but if the peritoneum has been previously irritated or otherwise injured, pathogenic microbes are far more effective. It appears also that chemical irritants cause inflammation with hæmorrhagic effusion, but without lesion of the intestinal walls or the penetration of microbes into the peritoneal cavity. Peritonitis, therefore, not due to putrefactive organisms, is local, while peritonitis produced by such pathogenic microbes as the staphylococcus aureus is rapidly fatal by general infection. Nearly coincident with our more intimate knowledge of the causes of infective peritonitis was the discovery of the means by which these pathogenic organisms can be destroyed. As these destructive agents must be applied directly to the microbes, the surgeon was brought into this field of therapeutics, and has here won some of his most brilliant victories, by boldly opening the peritoneal cavity and cleansing it with antiseptic solutions; but as there are many types of peritonitis, having their causation in different conditions, some being of a microbic and others of a non-microbic origin, it is as yet by no means certain where the line is to be drawn between the medical and surgical treatment of this disease. It is probable that the physician and surgeon will more nearly meet the multiform types which this affection presents by acting in concert, and discreetly employing the measures which each possesses according as they may jointly interpret the indications. Whatever may be the possibilities of the art of surgery in the treatment of peritonitis, and they are by no means inconsiderable, the question may pertinently be asked, Has any remedy, or combination of remedies, in the hands of the physician given results equal to or better than opium in a series of cases similar to those recorded in this paper? Prof. Fordyce Barker, who was for many years one of the obstetric physicians to the maternity wards of Bellevue, remarks, in his work on *Puerperal Diseases*:

"In this hospital, for more than twenty years, the opiate treatment . . . has been chiefly relied upon in peritonitis . . . and I do not hesitate to say that the records of this hospital will demonstrate a success in the treatment of this disease far beyond that which has ever been secured by any other method."

Is not this declaration as unimpeachable to-day as when it was first published, in 1874?

FURTHER STUDIES IN MALARIAL DISEASE.[1]

The Parasites and the Forms of Disease as Found in Texas.

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SINCE Macculloch (in 1827) applied the Italian colloquialism *mal' aria* to the hypothetical marsh miasm, the convenience of the term, in the absence of any accurate knowledge of the nature of that poison, has been universally recognized. By a familiar figure of speech, the term has come to be used as expressing the morbid processes set up in the human organism by the paludal virus. The reasons for uniting processes which differ so much in their clinical phenomena as, *e. g.*, common intermittent, comatose and hæmaturic fever, have been so frequently and so well stated that repetition is unnecessary. Since we have learned to know the *contagium animatum* of the disease in the organism most commonly known as the *plasmodium malariæ*, it seems expedient to drop the use of the word malaria as expressing the cause, but to use it as synonymous with the process itself. This is, in fact, done by leading writers in Italy and Germany, and to some extent in this country, and, though it may be deprecated by linguistic purists, will outlast the objections of the latter.

On account of the technical difficulties in the determination of the precise biological nature and life history of the parasites, the study of malaria must be followed on a number of distinct lines having a common goal. All the diseases classed as malarial—not considering the illegitimate use of the word at the hands of careless diagnosticians—in all parts of the world, must be re-studied, with the object of determining the presence or absence of the parasites. The organisms themselves must be studied at the same time, in order to fill out the gaps in our knowledge of their nature and mode of growth.

In order to obtain an accurate knowledge of the malarial parasites, it is necessary to observe them for a long period, in various kinds of cases, and during all the stages of the disease. In this way one learns in time how to explain some of the discordant views of various observers, and acquires a toleration for those he cannot reconcile with his own experience.

[1] Read, in abstract, before the Section of Practice of Medicine and Physiology of the American Medical Association, at Washington, May 7, 1891.

For some time I have worked on the lines indicated, and the results seem important enough to warrant their publication now.[1]

The studies now under consideration include a period of one year since the publication of some earlier observations. In this period I have examined, in the manner to be described, the blood of seventy-six persons. In order to have the greatest objectivity, in almost all cases the blood was examined before ascertaining the clinical peculiarities of the cases, and the nature (if malarial) and course of the disease predicted from that. If the examination be made at a favorable time a demonstration can be made more brilliant than in any other field of medical diagnosis. Naturally, I was most frequently called to examine cases of malaria, but a history of chills, of suddenly developing fever, of paroxysmal course of symptoms, or cachexia, sufficed to call forth a microscopical examination of the blood.

In 41 of the cases the parasites were observed. The other 35 cases included dysentery, influenza, phthisis, sepsis, enteric fever (four cases, with two autopsies, one of each having been diagnosed as malarial fever), intermittent neuralgia, and miscellaneous cases, one of which had been considered as malarial costal periostitis. The subsequent histories confirmed the exclusion of malaria. Owing to the occasional admission of a number of cases of malarial fever at the same time, some were missed, but no selection was made at such times. On the other hand, a number of cases were encountered which the blood-examination showed to be malarial, but in which the diagnosis would not have been made without it, or the verdict of time and the therapeutic test.

Such control observations are, therefore, of great value. Through them we may widen, and shall certainly deepen, our knowledge of malarial disease.

In my investigations I examined the blood from the finger-tip, at once after withdrawal, by a Zeiss one-twelfth inch homogeneous immersion lens, Oc. iv. In case the result was negative, another examination was made before the administration of remedies. This was done to meet the theoretical objection that if the examination is made just after the segmentation of the plasmodium, the small forms (spores) may be overlooked.

In 30 cases in which parasites were found the patients were put to bed and the temperature taken at intervals of two or three hours. No specific medication was given until the first paroxysm had passed, except in cases which seemed to threaten life. Observations were made at frequent intervals on the fresh blood, and cover-glass preparations made in special cases.

Origin of the Cases.—The diverse origin of the cases studied by me adds to the importance of the observations. Six cases originated in Galveston, and, with one exception—a case of severe remittent fever—include all of local origin admitted to hospital during the year. This indicates a peculiarly favorable locality for investigating the etiology of malaria, to which I hope to give special attention.

Seven patients came from various parts of tropical America, and were seen within a short time after leaving the place of infection. Six of these I have already reported;[1] the seventh, from the northern side of the Isthmus of Tehuantepec, was one of malarial cachexia with crescents only. Negative observations, probably at the hands of inexperienced investigators, have led to the statement that the tropical malarial fevers differ essentially from those of temperate zones—a statement so at variance with the views of judicious clinicians familiar with the disease as to require more than ordinary proof.

The rest of the cases originated in various parts of the interior of Texas, and in that notoriously malarial part of Louisiana, on the Gulf of Mexico, between the Sabine and Mississippi rivers.

Influence of Season.—Malaria exists in my field of observation all the year round, but there is a spring maximum of intermittent, some of considerable severity, and an autumn maximum, with remittent fevers and atypical cases of all kinds, from the mildest to those which kill in a few paroxysms.

In the season now reported, the long dry period in the late spring and the almost continuous rains in the beginning of this year, coincided with a decrease or total absence of cases. In June, there were two cases; in August, one; September, two; October, eleven; November, twelve; December, four; February, two; March, three; April, four.

On a Large Plasmodium, the parasite of tertian fever of Golgi.—In thirteen cases of the present series a large plasmodium was met with. In ten cases it was the only form; in three, crescents and a smaller plasmodium were found.

These forms begin as amœboid bodies about the size of the blood-plates, and when at rest slightly resemble the latter, but can be demonstrated to be within the red blood-corpuscles. Throwing out

[1] Notwithstanding the efforts of clinicians and biologists, no unanimity has been reached in regard to the zoölogical classification of the plasmodium malariæ. That it belongs to the protozoa is certain, with close affinities to the nomads or the sporozoa. The difficulties in the determination of its proper place are due as well to our limited knowledge of the other classes as to that of the form in which we are now interested. For this reason it is advisable to work up the life history of the organisms in the blood as completely as possible—not neglecting, of course, attempts at cultivating them—and at the discovery of the form in which they exist outside of the body. For this two things are necessary: a full knowledge of the characteristics of the blood in health and disease, as seen under high powers, and some acquaintance, even if at second hand, with the morphology and physiology of the protozoa.

[1] Fortschritte der Med., No. 5, 1891.

pseudo-podial processes they gradually increase in size. This is accompanied by the formation of pigment, usually in yellowish-red to reddish-black rodlets. As they grow larger the invaded red corpuscle flattens out and becomes paler. Finally, the corpuscle is almost or entirely destroyed, and the plasmodium enters on the stage of segmentation.

That, at least, is the usual, or, if we may use another term, normal sequence. But the plasmodium may escape from the corpuscle at any stage, and, at any time, either in the corpuscle or free in the plasma, can undergo segmentation. In an earlier communication[1] I described the peculiarities of some of these forms, and many times in the present series have been able to confirm those observations.[2]

In seven of the ten unmixed cases I was able to study the typical segmentation of the organisms. In none of these did I encounter the precise form described as the usual one by Golgi, and which I had seen in previous seasons.

Most of the segmenting bodies of this series resembled those described by Golgi as having the second mode of division.[3] In this the pigment is gathered in one or several small heaps, while the whole body of the plasmodium becomes separated into small round or oval bodies, which are ultimately liberated.

On account of their minuteness these spore-like bodies are very difficult to study. Whether they are supplied with flagella, as seems probable, or whether flagellate amœba forms issue from them cannot yet be said. Certain it is, that in one way or the other, in a comparatively short time they infect in turn red corpuscles, and so continue their species for another generation. With the ordinary solutions of methylene-blue the spores stain on the periphery, leaving a clear, round, central space.

Occasionally I have seen the forms of segmentation described and figured by Celli and Guarnieri,[4] Councilman,[5] Dolega,[6] and Plehn,[7] and which, on account of technical difficulties, cannot be reproduced here. Sometimes a number of segmenting bodies, differing slightly in shape of spore and arrangement of pigment, were met with in a single case and in a single preparation.

The conclusion has been forced on me that the differences in the details of the segmentation are of minor importance. Similar variations in the appearances and details of the reproductive phase, depending on slight changes in the environment, are not uncommon among other protozoa.

The more regularly segmenting forms of these parasites require about forty-eight hours to complete their development. In only one case have I had to do with a pure tertian, but in six cases of quotidian type I have been able to recognize the existence of generations in different states of development. Predictions based on this fact were verified by the result of segmentation of the larger forms in the next paroxysm, and afterward by the gradual development of the smaller forms.

The tertian case gave the most striking example of the time of development and succession of generations. The diagnosis of tertian was made at noon on the day of apyrexia, being the day after the first chill in the attack, and so, from the anamnesis alone, it being impossible to determine whether it was to be tertian or quotidian. All the many plasmodia found measured from one-half to five-eighths of the diameter of a red cell, so the acme of the next paroxysm was predicted for twenty-four hours later. The temperature rose slowly from midnight to 10 A.M., when it was 101°. Half an hour later there was a slight chill, and the temperature rose rapidly to 105°, which point it reached between 2 and 3 P.M. At the time of the chill all the forms were large—as large as, or larger, than a normal red corpuscle. Some were beginning to divide after the manner of Golgi's second form. Segmenting forms were present in all specimens for more than two hours, when—though some of the plasmodia had not quite reached that stage—the smallest amœboid unpigmented forms, the results of the segmentation first seen, began to appear in the blood corpuscles.

It is almost needless to say that I recognize a close connection between the reproduction of the plasmodium and the febrile paroxysm. In making this statement we must clearly understand what a paroxysm in malaria really is. It is unnecessary to discuss that now. But in regard to the chill, it must be remembered that even in vernal intermittents, in which it almost always appears, it has no fixed place in the temperature curve. It may take place early in the rise, or it may only occur near the acme. As the result of experience, I have stopped predicting the probable time of a chill, but speak instead of paroxysms only, with some qualification as to

[1] THE MEDICAL NEWS, July 19, 1890.

[2] In one instance the peculiarities were more marked than in any I have seen before. This was in a case of tertian intermittent, in April. Near the acme of a paroxysm a plasmodium, which showed the characteristics of atypical segmentation, escaped from the remnant of a red corpuscle. Its diameter was equal to that of a normal red cell. At once the pigment in the outer zone began to circulate, forming many complete circuits in one direction, then reversing the direction. The pigment in the centre, which outlined three round spaces, was all this time in the "ebullition" motion. Gradually, the spaces became more distinct, and in them appeared the small spherical highly refracting bodies. A few minutes later a long and distinct flagellum appeared at one side, with pigment moving in it. At the end of half an hour all motion had ceased.

[3] Fortschritte der Med., No. 3, 1889.

[4] Fortschritte der Med., Bd. vii., Nos. 14, 15, Taf. iii., Figs. 3, 4, 7, and 10.

[5] Ibid., Bd. vi., Taf. v., Figs. 3, 4; vi., 2.

[6] Ibid., Bd. viii., Taf. v., Figs. 5, 6, and 11.

[7] Aet. u. klin. Malaria-studien, Taf. ii., Figs. 2, 3.

the probable time of the acme. I find the plasmodia reach the maximum size about the time the temperature begins to rise, and that segmentation begins within a period of not more than three to four hours later.

The period of forty-eight hours, though the normal one, so to speak, is by no means invariable, as we can easily see in cases with anticipating or postponing paroxysms. I have seen the time shortened by twelve hours. Causes of which we have as yet no definite idea may so alter the rapidity of the development that there is no ground for denying that the development of single generations may produce quotidian or quartan paroxysms. Postponing paroxysms may be supposed to be caused by some delay in the development of the spores, though the opposite process cannot so easily be applied to anticipating paroxysms, which are probably due to the development of generations displaced, so to speak.

The severity of symptoms in my cases has been in relation to the number of organisms found. The severity, however, of these cases, aside from the anæmia in protracted cases, does not compare with that in the cases accompanied by small plasmodia, to be described later. The seven cases in which the large and typically segmenting plasmodia occurred were of intermittent type. In an eighth case in which this form was found the patient gave a history of (vernal) intermittent, but the case could not be followed up.

Two of the three cases in which this form was found with the small form were also intermittents. One of them, from Tehuantepec,[1] was a tertian with chills at 3 A.M. and acme at 7. The other, from Nicaragua,[2] quotidian without chills, with paroxysms in the afternoon. The third was a fatal case with subnormal temperature.

The two remaining cases belong to a class to which I have called attention before, and which I believe to be accompanied by the plasmodia of peculiarly atypical development. In these cases predictions based on the forms discovered were verified. The patients were kept under observation a week each, without quinine. The temperature was not measured, but there were no chills and no perceptible fever. The symptoms were only of the same vague character as those alleged by the patients as existing for some time, viz., pain in the bones, loss of appetite, headache, with anæmia.

Unfortunately, such patients will not remain in hospitals long enough to have careful observations made. They offer a very interesting field for observation, and the idea of their dependence on the atypical plasmodia, if confirmed, will give a scientific explanation of certain forms of malaria otherwise difficult to understand.

The Flagellate Bodies.—In the present series of cases I had abundant proof of the statements I made a year ago in regard to the origin of the flagellate organism. Out of the thirteen cases in which the large plasmodia were found, flagellate bodies were discovered in seven. Five of these were acute vernal intermittents—recurrent attacks which could be traced to infections in the last summer and autumn. Two were cases in which small plasmodia and crescents also occurred. Of the other six cases, three were seen only once. In one case the bodies were found in the third paroxysm of the season. In all cases I was able to observe their development from the atypical endoglobular plasmodia, after becoming free in the plasma, and within a short time after the exit from the corpuscle was observed.

The formation of the flagella while the body is still in the red blood-corpuscle, which I reported a year ago, had already been observed by Celli and Marchiafava, as I did not know at that time. It has since then been confirmed by Plehn.[1] It makes the parallel between these bodies and the *polymitus malariæ* of Danilewsky complete. From the observations of Plehn and myself, and of Antolisei,[2] we may assume as settled that the most perfect and characteristic of the flagellate bodies are closely related to, in fact derived from, the parasites of intermittents, not only in tropical and subtropical countries, but also in those temperate latitudes where the less severe but more typical forms of malaria occur. It is also beyond question that they appear very early in the course of malaria. It is evident, therefore, that when Golgi asserts that the flagellate bodies may represent a transition stage in the development of crescentic bodies, he must have conditions in his field of observation very different from those in many others. I have never seen crescents appear in the spring malarial fevers, and I shall show later that they are most frequent in cases in which flagellates are not to be found.

I have before this showed a comparatively greater resistance to specific remedies on the part of the atypically segmenting bodies and flagellates as compared with the more regularly segmenting forms, and suggested on that ground the probability of their being resting-stages of the organism. The facts have been confirmed by several observers, but I no longer, in the light of a wider experience, maintain the hypothesis. The reason why they, even when free in the plasma, resist the action of

[1] Fortschritte der Med., Bd. ix., No. 5, p. 191.
[2] Loc. cit., K. Sch.

[1] Loc. cit.
[2] Riforma Med., 1890, Nos. 26, 27; Centralb. f. Bakt., etc., Bd. ix., No. 12.

quinine is a question greatly in need of a scientific explanation.

It is unnecessary to consider in detail the clinical features of cases in which the large plasmodia are found. One or two points only may be mentioned.

The blood is characterized by the tendency of the invaded blood corpuscles to flatten out, sometimes becoming as much as one and a half to twice the diameter of a normal corpuscle. An increase of leucocytes—large lymphoid and eosinophile—can often be noted at the time of the acme of the paroxysm.

Leucocytes containing pigment are rare. In not a single case of the present series were they found.

So far as we can tell from our present methods of investigation the various forms of this large plasmodium represent a single species. It is a kind having the widest distribution, having been found in all parts of the world when looked for. I myself have found it with the same forms in Philadelphia, in cases from various parts of Texas and Louisiana, and from Tehuantepec, Nicaragua, and Panama.

It is also found in all seasons in which malaria prevails. It occurs not only in cases of primary infection, but in the vernal recurrences of mixed infection, to be mentioned later, it is the only form to be found.

These facts are especially interesting in connection with the conclusions reached by Hirsch, as the result of his monumental research in the literature of malaria:[1] "Intermittent malarial fever, by far the most frequent and widespread form of malarial disease, is met with everywhere, and at all times wherever the disease prevails endemically or epidemically."

This form also shows a remarkable ability to remain latent in the body. As I have said, all the vernal cases so far studied this year have been recurrences of fevers acquired last year. One, with the longest free interval, was in the case of K. Sch., reported as a tropical case.[2] The large plasmodium was found in his blood for the last time December 14, 1890. Crescents were last noted December 22. The patient was kept on large doses of arsenic, quinine, and iron until December 29. He had fully regained his strength and gained very much in weight, though still very anæmic. Treatment was stopped and the man assumed the position of porter in the hospital. Malaria never occurs in the part of the city in which the hospital is situated, and in the months of January and February the only other case I saw was one from the tropics.

The following shows the course of the recurrence:

"*February 26*, 3 P.M. The patient, K. Sch., complains of complete loss of appetite. Says that yesterday, about noon, he felt cold, without a rigor; later had fever, headache, pain in extremities. Temperature 99.4°. Many endoglobular plasmodia, not fully developed. Predicted paroxysm for next day. The temperature fell to 97.4° at 10 P.M.

"*27th*. Temperature rose from 98.8° at 6 A.M. to 104.8° at 10. At 10 a rigor lasting half an hour. The temperature remained at the maximum for two hours and then fell. During the rise and acme the blood examination showed the process of segmentation in the parasites. During defervescence the patient received 20 grains of quinine in solution, in four doses.

"*28th*. Patient feels well. In the blood a few free bodies."

After this no more organisms were found until March 13th. The patient was given tr. cinchona comp. fʒij and five drops of Fowler's solution daily; the temperature ranged from one to two degrees above normal.

"*March 13*. Felt chilly at noon. At 4 P.M. temperature 100 °. In the blood a few plasmodia in early stages.

"*14th*. Temperature normal. In the blood plasmodia larger than yesterday. A few free flagellate bodies. Predicted paroxysm for following day, but gave 10 grains quinine hypodermically to abort it.

"*15th*. No chill, but temperature rose to 99.6° at noon. A few free bodies found in the blood. Quinine 20 grains."

After that there were no further symptoms, and the patient left the hospital, having obtained work outside.

In other cases there were intervals almost as long. They indicate the existence of a resting-stage of the organism, the precise nature of which and the causes determining its return to the active stage must be the task of future investigations.

(*To be concluded.*)

[1] Hist. Geog. Path., i. 167. [2] Loc. cit.

TURPENTINE AS A GERMICIDE AND ANTISEPTIC.

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ALTHOUGH the oil of turpentine (*Oleum Terebinthinæ*, U. S. P.) is not unknown as an antiseptic and germicide, its insolubility in water and its irritating properties have hitherto made its use impracticable. That it has its special uses, however, in this connection I have had abundant testimony.

It is a well-known fact among naturalists, that, if the air of a cabinet be impregnated with the vapor of turpentine, the specimens are safe from the ravages of moths and other intruders so long as this condition of the air of the cabinet remains.

Having learned the advantage of turpentine in

preserving entomological specimens, I concluded to try its germicidal properties in the cases containing surgical instruments. A bacteriological examination of the cases, made four weeks afterward and compared with the examination of cases not provided with turpentine, convinced me of its efficiency, and I soon afterward applied the same principle to drawers containing towels, gauze, bandages, etc.

The method is simple. The turpentine is placed in flat, large-mouthed bottles at the bottom of each case or drawer, the volatility of the turpentine causing the vapor to impregnate the surrounding air.

Of late I have also placed my surgical instruments, the night preceding an operation, in a flat dish containing oil of turpentine. The instruments are completely sterilized, are not injured by the submersion, and are easily dried by a piece of sterilized gauze or towel. The characteristic odor of turpentine can be removed by ether.

The cheapness of turpentine and the ease with which it may always be obtained, added to its special adaptability in preserving the aseptic condition of instruments, bandages, etc., by its vapor, may make it a valuable addition to the list of our antiseptics and germicides.

I have also used benzole in the above manner. Its greater volatility gives it a more rapid germicidal action than turpentine, but its great inflammability admonishes caution in its use.

A REPORT OF TWO CASES OF EXTENSIVE COMPOUND DEPRESSED FRACTURE OF THE SKULL.[1]

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FROM a number of cases of compound depressed fracture of the skull which have come under my care in my service at the Episcopal Hospital I have selected the two following to report at this time because of their exceptional gravity and as showing the results obtained by prompt operation, thorough drainage, and careful antisepsis:

CASE I.—A lad, Fred W., aged seventeen years, was admitted to the hospital on the afternoon of March 5, 1890. A few moments before admission, in attempting to jump from a descending elevator in a mill in which he was employed, he had missed his footing and fallen headlong from the fourth floor of the building down the elevator shaft, landing upon a stone pavement in the basement. While being conveyed to the hospital in the ambulance the boy had a convulsion, at the end of which his breathing almost ceased. Reaching the hospital he was taken to the receiving ward, where I was at the time with my resident physician, Dr. F. Rudderow. The patient was completely unconscious, had marked symptoms of compression — widely-dilated pupils, stertorous breathing, etc.—and, beside the head injury, he had a simple comminuted fracture of the left leg and a lacerated wound of the popliteal space.

A moment after he was placed on the bed in the ward he had a very severe clonic convulsion, ending in tonic spasm of the muscular system so long that he became asphyxiated and death seemed close at hand. I ordered a hypodermic injection of atropine to be given and instituted artificial respiration. The color and condition of the patient soon improved and respiration was reëstablished.

A superficial examination of the head showed an irregularly shaped scalp wound, communicating with a depressed fracture of the skull, at the right anterior part of the vertex. I had the patient taken at once to the operating room and placed upon the table, his head shaved, thoroughly scrubbed, washed with alcohol and then with bichloride solution, the ear of the injured side being also well cleansed with the last. Upon enlarging the scalp wound I disclosed a compound, comminuted, and depressed fracture, involving the frontal and parietal bones and extending downward toward the temple. The uppermost limit of the fracture was in the parietal bone, about one inch from the sagittal suture. The region of depression was about an inch outward from this and had an area of some two inches.

Applying the trephine near the posterior border of the latter, I had just got the instrument well set in the bone when the patient had another very violent convulsion. Remembering the respiratory embarrassment which had appeared at the end of the two previous seizures, I saw that everything probably depended upon the immediate relief of the compression, and, several assistants holding the patient as quiet as possible, I rapidly completed the trephining, and with the elevator dislodged the depressed and impacted fragment. Instantly the pupils contracted to the normal, and the patient gazed about him in amazement. In reply to questions he told me his name and where he lived, and realized that he was in a hospital, although he did not know why he was there—in other words, he had no recollection of the accident.

Proceeding with the operation, I found that at the place from which I had removed the depressed fragment of bone the dura mater was torn, and damaged brain substance protruded. Pressing the latter in, I saw beneath the dura, and close to the margin of the wound in it, the edge of a clot. Enlarging the dural opening with scissors, I removed the clot, which was not large, and irrigated the brain with 1:2000 bichloride solution. My attention was then attracted to a slow but constant welling up of blood through the line of fracture (which extended downward on the side of the skull), and, pressing the dura aside with a finger, I found that a quite noteworthy amount of hæmorrhage was taking place. Again using the trephine, I made an aperture in the parietal

[1] Read before the Philadelphia Academy of Surgery, April 6, 1891.

bone near its anterior inferior angle, and at the posterior edge of the line of fracture. Enlarging the opening with rongeur forceps, and pressing the brain aside with the finger, I made a careful search for the bleeding point, but failed to locate it. It seemed, however, that some of the bleeding was coming from the diploë of the broken bones. I traced the fracture into the squamous portion of the temporal bone in one direction, and in the other into the upper border of the greater wing of the sphenoid. Being unable to find any vessel to tie, I decided that under the circumstances the best thing to do was to provide, by drainage, against the accumulation of a basal clot, and accordingly inserted a horsehair drain into the middle fossa, pushing it into position with my finger. This done, the operation was completed by cutting away with the rongeur forceps some irregular projections at the upper end of the fracture and inserting into the brain at the seat of laceration a catgut drain, bringing it through the wound of the dura, which was then closed with a continuous catgut suture. At the situations in which, from the removal of the trephine buttons and the comminuted fragments, defect of bone remained, I placed upon the dura some small pieces of the portions removed, which had been cut up with bone forceps and kept in a hot bichloride solution during the operation. Before suturing the scalp wound, horsehair drains and rubber drainage-tubes were placed so as to drain the wound from each of the four ends of the crucial incisions. The ordinary antiseptic dressings were applied, and, after the wound in the popliteal space had been dressed and the leg placed in a fracture-box, the patient was put to bed. He was perfectly conscious and rational, and remained so throughout the subsequent history of the case. The treatment ordered was an eighth of a grain of calomel every three hours without opium, and the diet for the first three days consisted of a pint of milk in the twenty-four hours. From the fourth day the quantity was gradually increased, and later a more liberal soft diet was allowed.

Immediately after the operation the temperature was 99⅘°, and the respirations 36. Four hours later the former had risen to 100⅘°, while the latter had fallen to 26, afterward descending to the normal, and there remaining. On the morning of the next day the temperature was 99⅘°. At my visit I found that the dressing was quite saturated with blood and accordingly renewed it. On the morning of the third day the temperature was 99°, but it rose in the evening to 101°. An enema was then given and an intestinal evacuation secured, and by the next morning the temperature had again fallen to 99°. After that it remained practically normal, only once reaching as high as 99⅘°.

A fresh dressing was applied on the fourth and one on the eighth day, the rubber drainage-tubes being removed on the former and the intra-cranial and superficial horsehair drains on the latter, there being no discharge at that time.

The wound healed promptly, except at the spot where the brunt of the force of the fall had been received, and here, after a few dressings, the process of granulation was established and soon completed. When I went off duty at the end of March the patient was perfectly well, so far as the head injury was concerned; his broken leg, however, in the union of which there was some delay, kept him in the hospital until the end of May, at which time he was discharged, recovered.

CASE II.—L. —, aged forty-two years; admitted to the hospital on the afternoon of January 23, 1891. While at work in a shipyard he was struck on the top of the head by the crank handle of a very heavy crane, which broke while he was standing beside it. He was taken at once to the hospital, and, happening to be there at the time, I saw him immediately after his admission.

On examination a scalp wound was seen on the vertex anteriorly, to the left of the median line and communicating with a comminuted and depressed fracture, from which a good deal of arterial blood persistently oozed. The left upper eyelid was swollen and discolored by effused blood. The patient was conscious and gave his consent intelligently to my proposition to operate. He complained only of soreness in his head and a sense of chilliness, his temperature being subnormal.

I had the head immediately shaved and cleansed, the wound irrigated with bichloride solution, a temporary wet bichloride gauze dressing applied, and hot-water cans placed about the patient, and waited a short time for reaction to set in.

In about an hour and a half, the patient's condition being more favorable, I had him etherized, the head again thoroughly cleansed, as well as the ear of the injured side, and then enlarged the scalp wound by a crucial incision and exposed the depressed part of the fracture. The line of fracture commenced in the frontal bone in the median line and extended downward and outward obliquely across the coronal suture into the parietal bone, seeming to go as far as its lower border. Cross lines of fracture made several comminutive fragments, and one of these, a large one, was driven firmly down at a point about two inches from the median line. I applied the trephine on the parietal bone at the posterior margin of the depressed fragment, and, enlarging the opening with the rongeur forceps, elevated the fragment, which came away together with some smaller pieces which were wedged in with it. One of the latter had penetrated the dura within half an inch of the superior longitudinal sinus, and from the irregular tear injured brain substance protruded. After irrigating the latter carefully with bichloride solution, I proceeded to inspect the rest of the injury, and, pressing the dura aside with my little finger, saw that arterial blood was welling up from the side of the cavity of the skull, and that a large clot was forming between the dura and the bone. Removing this I was startled by a free and rapid flow of arterial blood, and began to enlarge my opening in the skull with the rongeur forceps, but finding them rather slow I laid them aside and trephined at the anterior inferior angle of the parietal bone, having first extended my incisions in the scalp sufficiently to obtain free access to the locality. On removing the button I exposed directly in the centre of the opening a large branch of the middle menin-

geal artery, which had been torn across and was bleeding freely. The opening made by the trephine being too small to enable me to secure the vessel as I intended, by including it in a suture in the dura, I had to gain more room by using the rongeur forceps, in the meantime getting my resident physician, Dr. L. H. Adler, Jr., to pass a finger from the upper opening, between the dura and the bone, and to make pressure upon the bleeding point. While cutting with the rongeur forceps, I found that another line of fracture, extending from the lower part of the frontal into the squamous portion of the temporal bone, made another large comminuted fragment, which became loosened and was removed. Having gained sufficient space, I was about to secure the bleeding vessel in the manner alluded to, when it was discovered that the needle, which was the only one of appropriate size in the hospital, had been mislaid, and I was obliged to apply the ligature with the assistance of the hæmostatic forceps, which was successfully accomplished with a little care and gentleness. We then discovered that this had but partially controlled the hæmorrhage, and I made further search in the region of the spinous foramen of the sphenoid bone, thinking that perhaps the main trunk of the middle meningeal was injured, but, upon pushing the brain aside, I found that this was not the case. My patient being in a not very favorable condition, I decided to trust to pressure, by means of strips of iodoform gauze, for controlling the flow of blood. Taking several narrow strips, they were inserted one after another into the side of the middle fossa of the skull, the ends being left projecting from the temporal end of the wound. Before closing the latter I endeavored to suture with catgut thread the wound in the dura mater near the superior longitudinal sinus, but found that there was so little of the membrane left toward the side of the sinus that the stitches would not hold. Therefore, having inserted a catgut drain into the lacerated brain substance, I placed over the tear in the dura another compress of iodoform gauze, taking the ends of the strips out of the extremity of the wound at the median line. A rubber drain having been laid across the wound in both directions, and some fragments of bone thrown upon the dura at the position where the greatest deficiency of bone existed, the wound was hastily sutured and an antiseptic dressing applied, the ear being well dusted with iodoform and a dossil of bichloride cotton placed in the meatus.

The patient was put to bed, an ice-bag applied over the dressing; he was given one-fourth of a grain of calomel with one-eighth of a grain of opium every three hours, his diet consisting of one pint of milk daily. He remained conscious and manifested no observable paralytic symptom. For the first three days the temperature, at its highest, reached 101°, and only twice thereafter was it above 100°. The dressing was changed for the first time on the third day, when it was found saturated with a sanguinolent discharge. It was renewed again on the fifth day, being again soiled with bloody drainage. On the seventh day acute symptoms of ptyalism developed and the calomel was discontinued. That night and the following one the patient was somewhat delirious. On the fifth and eighth days the iodoform compresses were removed. The drainage-tubes were gradually shortened and at subsequent dressings finally removed. The wound healed quite promptly, and the patient was allowed to get out of bed for the first time on the 4th of March.

I asked my colleague, Dr. Albert G. Heyl, of the ophthalmic staff of the hospital, to examine the patient's eyes, as he has frequently done in other cases of cerebral injury in my wards. He reported finding no lesions of the fundus of either eye, but that there was diplopia due to paralysis of the external rectus muscle of the left, which he thought might have been due to orbital ecchymosis. This symptom, diplopia, is the only remaining inconvenience which the patient suffers. He was discharged from the hospital shortly before the end of March.

ORIGINAL LECTURES.

THE HEART: ITS MURMURS, THEIR DIAGNOSIS AND TREATMENT, AND THE ACTION OF THE CARDIAC TONICS AS A CLASS.[1]

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LECTURE II.

GENTLEMEN: Last week we reviewed the valvular lesions implicating the left auriculo-ventricular orifice. To-day I propose to discuss those murmurs which are produced at the aorto-ventricular outlet. First of all, however, I desire to show you a patient who has three well-defined cardiac murmurs, and one that is less distinctly marked, that you may appreciate how easily these murmurs can be recognized and placed, by following the topographic scheme which I have arranged for locating the point of maximum intensity and the direction of transmission. Having settled these two points accurately, we are enabled to say just what the lesion is, and then to add all the other combinations that are commonly given in teaching the physical diagnosis of cardiac murmurs. As, for instance, having decided that a mitral regurgitation is present, we can say that there is a systolic murmur at the apex, that it occurs with or takes the place of the first sound of the heart, and that it is synchronous with the pulsation of the apex and radial pulse, etc.; but we are not compelled to confuse our mind with all these conditions before we decide as to the presence or absence of an abnormal cardiac sound. By studying these areas in routine order, and deciding as to whether abnormal sounds existed or not, and determining the direction in which they were transmitted, I have been able to verify my diagnosis at the post-mortem in almost every instance in which the opportunity has presented for an examination after death, until now I feel quite confident in regard to the diagnosis in this class of lesions. Without a large experience, however, in the post-mortem room, we have absolutely nothing upon which to rest

[1] A series of lectures delivered at the New York Post-Graduate Medical School and Hospital.

the certainty of the diagnosis that may be made. Unfortunately, too many of us are compelled to go through our whole medical career without ever having had the opportunity of personal and practical training in this most important branch of medical science—the combined clinical and post-mortem work. The more frequently we can place ourselves upon record as to the diagnosis, and have it confirmed or overthrown by the result of the necropsy, the greater will be the probability of obtaining skill in diagnosis.

Our patient, Mr. M. B., aged thirty-three, baker, first came under the observation of Dr. Adolph Zet, one of the instructors in my department, early in September last. At this time he stated that he had not been well for three years. During these years he has had several copious hæmorrhages from the bowels, each lasting about three days. In the intervals between the occurrence of the hæmorrhages the bowels have been fairly regular, but with a tendency to be constipated. He has also suffered a good deal from headache and vertigo, the latter especially after running up stairs. He has become very anæmic, and has developed considerable œdema of the lower extremities. Our patient has also suffered a little from dyspnœa, but has had no troublesome cough. His tongue is coated, pale and flabby. At one time, for a few days, he spat up some blood; aside from this, there is no evidence of hæmorrhage, either from the lungs or stomach. There is no history of scarlet fever, rheumatism, Bright's or any of the diseases commonly classed among the causative agents in producing endocardial lesions and valvular defects, with the exception of syphilis. The patient was placed upon laxatives and the heart tonic that we use for these cardiac affections, the formulæ of which will be given when we come to discuss the treatment of these lesions in general. Iron was also administered. The result of the treatment has been to improve his general condition and overcome in part the anæmia. The cardiac murmurs, however, have become more sharply defined, but the mechanical action of the heart has been very much improved. Physical examination, gives the following results: Inspection shows the patient to be somewhat anæmic; though in apparently full flesh, his tissues are soft and flabby. The apex impulse is not well defined or sharply limited. The subclavian arteries, however, are seen to pulsate very distinctly as they pass over the first rib. His respirations are shallow and hurried; the pulse is of the shot or bead-like character. Palpation and percussion yield a comparatively negative result. There is, however, without doubt, a moderate amount of cardiac enlargement, due to hypertrophy or dilatation, or both combined. We shall be able to determine this fact with greater accuracy after an auscultatory examination, for then we shall be able to decide what the exact mechanical defects are, to what degree they have advanced, and how much compensatory hypertrophy or cardiac dilatation has been developed. By percussion alone we may be led into gross mistakes, as I have frequently witnessed in making necropsy examinations. I recall one instance in which a number of gentlemen had examined the case and found, by percussion, a marked enlargement of the heart, but an absence of all other signs and symptoms that would warrant the opinion of cardiac hypertrophy or dilatation. At the post-mortem examination, the heart was found to be unusually small and weighed only six ounces, or one-half the normal maximum weight. Such results, frequently repeated at the deadhouse, have led me to be very sceptical in regard to the diagnosis of cardiac enlargement based upon percussion alone. There are so many conditions associated with the rise and fall of the diaphragm and the adjacent left lobe of the liver, and the expanded and contracted state of the lungs, that percussion at best is an uncertain sign, and very little reliance can be placed upon it in regard to cardiac enlargement. On the dead subject, as practised by the late Professor Alonzo Clark and Dr. Cammann, when everything is still and immovable, accurate results might be obtained, but not in the living subject, when everything is in motion and constantly changing position.

Upon auscultation of our patient, we find within the circle or mitral indirect area, which is lettered M I on our patient and in the chart, Fig. 1, instead of the normal first sound of the heart, an abnormal or blowing sound,

FIG. 1.

called a mitral indirect murmur. Further, we find that this sound is transmitted to the left along the sixth rib, that it is lost at the anterior axillary line, and that it is heard quite distinctly posteriorly, within the circle M I on our patient. Having ruled out the clear first sound of the heart, and heard in place of it at the anterior mitral indirect circle, and also posteriorly, the same sound within the ring M I, we are justified in saying that there is a leakage at the bicuspid valve orifice. As the murmur has not disappeared, although the general anæmia has improved under the treatment, we are confident that organic changes will be found in the left auriculo-ventricular valve if we have an opportunity to examine the patient after death. There is also a faint abnormal sound or mitral direct murmur, heard with greatest intensity within the limited area lettered M D on our patient and in the chart, see Fig. 1. This sound or murmur is of very short duration, and is not transmitted. You may find some difficulty in detecting this murmur, as it is

masked to a certain degree by the aortic and mitral indirect murmurs. But if you listen intently you will catch a decidedly abnormal sound, which is distinctly limited to the circle M D; if you move the chest piece of your stethoscope outside this area the murmur is entirely lost, and you will observe that its character is entirely different from the transmitted sound of the aortic or mitral murmur, with which it might be confounded. Thus we are enabled to decide that a certain amount of obstruction is offered to the current of blood from the left auricular cavity to that of the ventricle. In this particular case I believe the mitral direct murmur is due to the blood regurgitated at the aortic valve, falling into the ventricular cavity and floating up one of the segments of the bicuspid valve, as described in our last lecture. There is also a double murmur at the aortic valve, which you will fully understand after we have studied in detail all the lesions and murmurs that can be produced at the aorto-ventricular outlet. The abnormal sounds developed at this aorto-ventricular orifice are best divided into three general classes: *first*, those due to organic changes in the valve segments and the aorta, or in the substance of the ventricular wall as a whole; *second*, those due to congenital perforations in the segments of the aortic and pulmonary valves; *third*, the so-called hæmic murmurs.

In reference to the etiology of the first class of murmurs engendered at the aorto-ventricular outlet, they are, like those developed at the mitral orifice, due to congenital defects, seriously narrowing the aortic aperture or preventing juxtaposition of the three cusps of the valve, thus producing positive stenosis or incompetency. This form, or the congenital type, however, is exceedingly rare and in all my experience I do not remember to have seen a typical instance of the kind. The most frequent cause of valvular defects at the aortic outlet is secondary change in the segments due to an acute or chronic endocarditic lesion extending to and involving the valve, or the development of an acute or chronic endocarditic lesion on or near the valve, both of which ultimately involve the substance of the individual segments, causing vegetative outgrowths, stenosis, or thickening and retraction, with incomplete closure. Stenosis or incompetency may be developed independently of each other; but more frequently the two conditions are combined. If we comprehend the method by which these lesions in the aortic segments are brought about, it is easy to understand why a stenosis is most likely to be produced first, to be, later, followed by an incompetency of the aortic valve, causing the double murmur. Acute and chronic dilatation of the left ventricular cavity may result in a separation of the aortic segments to such an extent as to cause an incomplete closure of the aortic valve. From my experience of twelve years at the post-mortem table, I am fully convinced that acute dilatation is far more frequent on the printed pages of books than it is in the chest cavity of the individual, either during life or after death. Rupture of a segment of the aortic valve from its peripheral margin to its attached base will cause an insufficiency. Splitting of a segment in this manner is occasionally found at the post-mortem examination, in cases that have suffered from severe falls or crushing injuries implicating the thorax. I doubt the ability on the part of any human being to survive an injury of sufficient magnitude to lacerate the segment of a normal valve. As yet I have never seen any good evidence of such a case. I can recall one instance in which a rupture of an aortic segment was diagnosticated during the life of the patient, subsequently to a slight fall, by a most competent observer; when I made the necropsy, a few years later, the segments of the aortic valve were found to be normal and intact, and the true cause of the murmur proved to be a very small sacculated aneurism of the wall of the aorta just beyond the valve. In over two thousand necropsies, I have found only two cases of indisputable rupture of a cusp of the aortic valve and but one in which a mitral segment was lacerated; but in all three, death followed in a few hours after the reception of the injury supposed to be the cause of the rupture. At the aorto-ventricular aperture, we have an axial line upon which all murmurs are developed and transmitted. The direction of this axis is through the centre of the aorto-ventricular outlet from below upward, from left to right, and from before backward, following the natural course of the blood stream. All the murmurs, therefore, which originate at the aortic valve must necessarily be produced by the current of blood flowing through the now abnormal opening, either in the direct or in the indirect or inverse direction to the normal blood stream, or at right angles to a line drawn obliquely across the sternum opposite the third costal cartilages, as shown between the rings A D and A I in Fig. 1. The position of the aortic valve is behind the sternum, very nearly behind the oblique bar marked on the sternum in the chart, Fig. 1, and on the integument over the sternum of our patient. All abnormal sounds developed at this outlet will be due to an obstruction to the current of blood as it is thrown from the left auricular cavity through it into the aorta, or to the failure of the aortic valve to close tightly and prevent the leakage of blood back into the cavity of the left ventricle, which must of necessity follow incomplete closure.

Having developed the lesion, obeying the common law of production and transmission of cardiac sounds, we find that, if there is a stenosis or obstruction to the current of blood as it normally leaves the ventricle to reach the aorta, a murmur will be produced and heard just beyond the seat of its production, which is at the aortic aperture; or in the second intercostal space on the right side at the sternal margin, as indicated by the circle lettered A D in Figs. 1 and 2. This murmur will be produced by the blood passing in its natural course to the aorta and great vessels, and will be transmitted into them and heard with almost equal intensity over the subclavian arteries and the common carotids in the neck. When it is loud at the seat of development it will also be heard posteriorly where the aorta commences to impinge against the spinal column or over the fourth and fifth vertebræ. On the other hand if there is an incomplete closure of the aortic valve, the arterial tension forces some of the blood back into the ventricle and causes an aortic indirect or regurgitant murmur. This abnormal sound, according to the common law of development and transmission, is heard just below and to the left of the location of the aortic valve, or at the junction of the third intercostal space of the left side with the sternum, as indicated by the circle lettered A I in Fig. 1, and in our patient.

The natural course of the transmission of this murmur is primarily governed by the direction of the blood stream which caused its production and would be downward and forward toward the apex. This is true in part,

FIG. 2.

but, developed as it is, when the ventricle is expanding against the sternum, which is a dense structure, the common physical law of transmission of sound is obeyed, and the murmur is distinctly transmitted down the sternum and often heard with the same intensity over the xyphoid appendix as at the point of origin. In the second variety, or those due to congenital perforations in the cusps of the aortic and pulmonary valves, we often hear the same well-defined physical signs described in the case of an active and positive lesion producing incomplete closure of the aortic valve orifice. Having met with a large number of cases in the clinic in which positive evidence of aortic regurgitation was found, but in which the rational symptoms would not warrant the belief that a large leakage of blood from the aorta to the ventricle occurred, an attempt was made to find in the deadhouse a rational explanation for what at first appeared to be contradictory evidence. This resulted in finding a large percentage of cases that showed in the cusps of the aortic and pulmonary valves numerous little sharp-cut and distinct holes or perforations, located just behind the free margin. These openings varied in size from minute pin-point-like apertures to holes having a diameter of a quarter of an inch or more, and the number varied from one to a dozen. The clinical phenomena became at once perfectly clear; for any one who has attempted to make the valve of a mechanical suction and force-pump work perfectly tight knows how small an aperture will cause a leakage, and the same law unquestionably holds true here. Blood forced through these sharp-cut holes where the valve is tense and the edges in juxtaposition naturally causes a loud sound, while the volume of leakage back from the aorta into the left ventricle is too small to produce any dilating effect upon the ventricle or mechanical interference with the part acting as a pump.

That these apertures are congenital in origin appears to be true from the fact that they are sharply cut, as if punched out of the normal valve, and also from the absence of any of the common evidences of endarteritic or endocardial lesions implicating the valve segments, singly or as a whole. But for the presence of these holes the valve would be absolutely normal. They are also found from intra-uterine existence up to the advanced period of life, which also favors the congenital origin. These perforations have been observed by many, probably by all pathologists, but they are not generally recorded, from the fact that otherwise the valve was considered free from disease and also because they were regarded as of no particular account. I have often heard this remark, "A large per cent. of cases had them," and there it has ended. But when we note the facts that a large number of individuals present during life marked physical signs of aortic regurgitation, without the ordinary rational signs and in the absence of general discomfort; that many of these cases die from intercurrent diseases and the aortic valve is found to be thoroughly competent at the post-mortem with the exception of the leakage through these holes; that some of our most competent clinical teachers make the broad statement that individuals having well-marked physical signs of aortic regurgitation attain a good old age, when true aortic regurgitation is regarded as the most fatal valvular lesion; that some state that an aortic regurgitation gives the greatest expectation for life, and further that the statement is made that in a large percentage of instances the post-mortem examination does not sustain the diagnosis made during the life of the individual, it seems to me time to attach some importance to this lesion, and to place an interpretation upon our signs and symptoms which will enable us to have our diagnosis confirmed in the deadhouse in almost every instance—it may be asking too much to say in every case, but the error ought to be the exception to the rule and not the frequent result. Since taking this view of the subject and working upon its principles, my diagnosis has generally been confirmed at the autopsy. I have frequently diagnosticated these congenital perforations before the class in this room, and later have had the privilege of showing the same class the heart containing these perforations which they had previously listened to in life. Aortic regurgitation from incomplete closure of the aortic valve can be differentiated from regurgitation due to congenital perforations by observing the following differential points:

Aortic Regurgitation from	
Incomplete Closure.	*Congenital Perforations.*
Physical signs almost the same, except marked cardiac enlargement.	Physical signs almost the same. No uniform enlargement of heart.
Marked subclavian pulsation.	No subclavian pulsation.
Shot or bead-like pulse.	Pulse normal.
Marked dyspnœa.	No dyspnœa.
Cardiac interstitial pneumonia.	No brown induration of lung.
Cough, with bloody sputum.	No cough or sputum.
May have pulmonary hæmorrhage.	No pulmonary hæmorrhage.
Dropsy usually marked.	No dropsy.
Great general discomfort.	No general discomfort.
May be improved by treatment.	Not affected by treatment.

The comparative study of these two classes of murmurs shows conclusively that we must not be governed exclusively by the loudness and intensity of the abnormal sounds in the diagnosis and prognosis, but we must carefully consider all the evidences presented, before coming to a final conclusion. Above all things, never make a diagnosis or prognosis upon a single examination, but insist upon placing the patient upon suitable treatment and several examinations, and then a wonderful degree of accuracy in diagnosis can be obtained.

Hæmic murmurs, so-called, may be produced at the aortic and mitral orifices in very anæmic subjects. They may be of the direct or indirect variety. When due simply to changes in the blood which alter its density and render it more irritating to the poorly nourished valve-orifices through which it passes, they are usually of the direct type. A direct murmur may be produced both at the mitral and aortic orifices in every anæmic case, but, as a rule, they are not, unless the anæmia is very pronounced and of considerable duration. More frequently, however, the anæmic state of the system disturbs the nervous innervation of the heart or impairs the nutrition of its muscular wall, and causes an incomplete closure of the mitral valve and a mitral indirect murmur, as already described in the last lecture. In rare instances the left ventricular wall may become thin and its cavity dilated so as to prevent a complete closure of the aortic valve, and thus establish an aortic regurgitation. The diminished volume of blood in anæmia, however, will generally prevent any dilatation. The hæmic murmurs will be heard and transmitted in the same manner as the murmurs already described as occurring at the mitral and aortic orifices. They are differentiated from the other forms of murmurs by the anæmia, and the disappearance of the murmur with the removal of the anæmic condition.

You may have noticed in following me, that I have made no mention of the valves of the right side of the heart, except in my description of the pathological changes which are developed from a primary mitral incompetency. Neither had I intended to, but finding since my last lecture that much doubt existed in the minds of some as to the amount of value to be attached to the physical exploration of the right side of the heart, I have concluded to make a few remarks upon the subject in question. During a period of more than twelve years of continuous work in the deadhouse, in which time the number of post-mortems witnessed has reached thousands, I only saw one instance in the adult subject in which there was a primary lesion of the valves upon the right side of the heart, and that was a congenital incompetency of the pulmonary valve. During the life of this patient, although examined carefully by most competent observers, the primary lesion was regarded as an aortic insufficiency, with secondary changes at the pulmonary and tricuspid valves. The pulmonary and tricuspid leakage could not be overlooked, on account of the marked jugular pulsation which was synchronous with the systolic action of the ventricles, the general venous engorgement and the cyanotic state of the system. But none of the examiners detected or recognized a tricuspid regurgitant murmur; the chief cause of the murmur at the base was supposed to be due to incomplete closure of the aortic valve, followed by a similar defect at the ventriculo-pulmonary orifice. Neither have I ever heard a tricuspid indirect murmur, even in cases in which a large volume of blood was continually flowing back into the great veins, as is frequently observed when the pulmonary valve becomes incompetent, as described in the circle of pathological events which follow in order the mitral regurgitation described in my first lecture.

I have often heard a murmur over the "triangular præcordial space," described by some authors as the "tricuspid area," but the post-mortem examination in these cases always revealed numerous perforations in the cusps of the aortic and pulmonary valves, which defects, to my mind, most thoroughly explain the cause of the murmur heard during life, for in their absence the murmur is not heard, and the frequency of the perforations found post-mortem helps to explain a possible mistake. There are also anatomical and physiological reasons why tricuspid regurgitation cannot occur and give rise to a murmur, and especially if the pulmonary valve is competent. It is a well-known anatomical fact that the tricuspid valve is not capable of being closed perfectly at any time, and yet mechanical regurgitation does not occur to any extent. This fact is explained by the perfect closure of the pulmonary valve, which is rarely the seat of pathological lesions during adult life, together with the powerful aspiratory force of the respiratory act, which is constantly producing a large vacuum, as it were, in front of the right heart, so that normally the right ventricle is best described as pumping into a vacuum, which tends to suck the blood from the veins and keep up a constant flow of blood from the veins into the right auricle and ventricle. This reduces the possible chance of regurgitation from the right ventricle into the right auricle and veins, while the pulmonary valve is competent to an almost inappreciable minimum. It is far easier to suppose that the right heart will, and can, pump more easily into a vacuum than against the simple zero pressure of the great veins. Taking into consideration this powerful aspiratory force, and the fact that the venous capacity of the system is about three times as great as the total bulk of the blood, and then admitting that considerable tricuspid regurgitation does occur, it is even now hard to comprehend how the regurgitated blood from the auricle could cause disturbance enough in its backward flow to produce a murmur capable of being detected, because the pressure of the right ventricle is low and the resistance to the outflowing blood almost inappreciable. It is not logical to compare tricuspid insufficiency to the mitral lesion, in which the left ventricular pressure is very great, and being favorably influenced by a constantly increasing auricular and pulmonary tension, aided after a short time by that of the right ventricle. If the tricuspid regurgitation is secondary to profound lesions on the left side of the heart, and finally at the pulmonary valve, the murmur, if one is produced at the tricuspid valve, will be masked by murmurs of higher pitch and wider diffusion, which are already developed at the other valves where the mechanical strain is very much greater, and where the reversed or opposing blood-currents will produce more decided disturbances in the mechanism of the heart and its valves. Then, again, if we stop and consider for a moment the direction of the current of blood which is capable of pro-

ducing tricuspid regurgitation, and the laws which govern the production and local point of intensity of the murmurs and their transmission, we find another obstacle to the development of the sound of this murmur where it is commonly said to be found. The axial line for the right auriculo-ventricular orifice corresponds to a line drawn from left to right from before backward, and from below upward; or on an axis transfixing the body from before backward, from left to right, and from below upward, starting in front on the left side at the junction of the fifth costal cartilage with the sternum, passing through the chest, coming out posteriorly at the fourth intercostal space at the posterior axillary line. The tricuspid valve is situated on the line of this axis behind the right border of the sternum, opposite the junction of the fifth costal cartilage and the fourth intercostal space of the right side. The point, therefore, at which the tricuspid murmur could be heard with the greatest intensity would be just beyond the seat of the valve, or over the junction of the fifth costal cartilage and the fourth intercostal space, immediately beyond the right border of the sternum. Following the direction of the current of blood producing the murmur, it ought to be transmitted toward the centre of the right lung. In the transmission of the tricuspid regurgitant murmur, if it ever occurs, we cannot take advantage of the sternum as a medium by which the murmur could be transmitted in an opposite direction to the current of blood which is producing the abnormal sound, as is done in the mitral regurgitation. The reason for this assertion is that, at the time of the systole, the right heart is rolling backward under the cover of the right lung, and away from the sternum, and at the same time the lung on the right side, with each inspiration, is being crowded in between the heart and the anterior chest wall, all of which will tend to prevent the transmission of a tricuspid regurgitant murmur back against the current by which it is produced, and will tend to prevent its ever being heard in the immediate vicinity of or over the sternum. Viewed in this light, and in face of the opposing post-mortem facts, when we come to analyze the evidence candidly there is comparatively no ground for believing that a tricuspid murmur is produced and heard over the sternum. It seems, however, almost a waste of time to discuss at this length a condition which is considered by many of the best observers as out of the question.

At our next lecture, gentlemen, we will consider the treatment of these cardiac affections, the physiological and therapeutic action of the drugs classed as cardiac tonics and stimulants.

MEDICAL PROGRESS.

Remote Effects of Removal of the Uterine Appendages.—In a paper "On the Remote Effects of Removal of the Uterine Appendages," read at the French Surgical Congress, LAWSON TAIT (*Medical Record*, May 2, 1891) repudiated the statement that permanent evil results followed removal of the tubes and ovaries for disease of the uterus or its appendages, or for the relief of nervous disorders. He distinguishes between the sequelæ following removal of the ovaries or of the testicles before the period of puberty and those resulting from removal when the organism has attained maturity. He maintained that the changes immediate and remote which followed removal of the uterine appendages for disease were analogous to those which take place at the menopause. The scientific tenor of the paper is somewhat ruffled by an occasional outburst of virulence against those who differ with Tait.

Hæmocyne (the Serum of Dog's Blood) in the Treatment of Tuberculosis.—HÉRICOURT, LANGLOIS and ST. HILAIRE (*Gaz. Méd. de Paris*, 6, 1881) had made 150 injections of from one to three cubic centimeters (fifteen to forty-five minims) of the serum of dog's blood in the treatment of a number of cases of phthisis. The injections were made in the lumbar region at intervals of two or three days, and were, as a rule, unattended with local or general reaction. Of the four cases reported, two had both pulmonary and laryngeal phthisis. In these two the condition of the larynx improved and the voice became stronger. In all the appetite improved, the cough and expectoration diminished, the night-sweats ceased and the weight increased. The physical signs underwent little change.—*Centralbl. für klin. Medicin*, May 9, 1891.

Tachycardia at the Menopause.—KISCH (*Wiener med. Presse*, May 10, 1801) has observed twenty-eight cases of tachycardia in women at the climacteric period. At the time of the menopause, rarely after complete cessation of menstruation, such women suffer occasional attacks of palpitation, often on slight or no provocation. There may be, besides, a sense of anxiety and oppression, arterial pulsation, fulness of the head, flushing, headache, mist before the eyes, ringing in the ears, vertigo, and possibly loss of consciousness. The pulse is 120, 150 or more, strong, full, and regular. Tracings show a large wave, with a sudden, rapid ascent and a similarly sudden and abrupt descent, almost reaching the base line before the occurrence of the secondary elevation, which is increased. The heart-sounds are clear and voluminous. Fugacious redness of the face, neck, and chest sometimes appears, attended with a sense of burning. The paroxysms may occur several times daily or at intervals of a number of days, and last from several minutes to a quarter of an hour. There is usually a condition of bodily and mental restlessness. In the majority of cases observed by Kisch there were evidences of plethora; the blood was found to contain an excess of hæmoglobin. There was neither marked dyspnœa nor cardiac asthma; manifestations of stasis were rare; œdema of the lower extremities was exceptional; the urine contained no albumin. The patients felt an unwarranted fear of apoplexy. The disorder may last from a few weeks to two years or more. It was attended with no injurious sequelæ. Systematic, gentle purgation, associated with suitable dietetic regulations, exercised a beneficial influence. Mountain air, a bland diet, active exercise, and cold affusions were useful. Bromides, in small doses, may be used for their sedative effect. Kisch ascribes the etiology to the changes in the ovaries at the climacteric period: hyperplasia of the stroma at the expense of the parenchyma, with retrograde metamorphosis of ovisacs, giving rise to

nervous irritation. An analogous explanation has been given to the tachycardia observed in hysterical patients and in women from whom the ovaries have been removed during the period of maturity—the changes resulting from consecutive atrophy causing irritation of nerve fibres.

The Source and Function of Pus Corpuscles.—Before the Academy of Sciences, RANVIER (*La Médecine Moderne*, May 7, 1891) expressed the view that the phenomenon of diapedesis is not sufficient to explain the rapid formation of large quantities of pus. Twenty-four hours after injection of a solution of nitrate of silver (3 : 1000) into the peritoneal cavity of a mammiferous animal, the so-called clasmatocytes have almost entirely disappeared, being replaced by a large number of leucocytes. Intermediate forms between these two may be observed. The irritation has induced in the clasmatocytes a return to the embryonal state; they are transformed into leucocytes, which multiply by division. Of two rats, into the peritoneal cavity of each of which six drops of a solution of nitrate of silver (3 : 1000) were injected, in one, at the end of twenty-four hours, the cavity contained a large quantity of purulent fluid; in the other, at the end of three days, no pus had formed. In the first instance, the pus corpuscles contained débris of varied character, red cells, fat granules, grains of albuminate of silver, cellular fragments, etc. The interpretation is that the injection caused the necrosis of a considerable number of cellular elements, the products of the destruction of which it is the function of the pus cells to remove, in order that the processes of repair may be carried on.

Microcidin—a New Antiseptic.—POLAILLON (*La Médecine Moderne*, April 30, 1891) presented to the Academy of Sciences the results of an experimental and clinical study of the product obtained by heating β-naphthol to liquefaction and adding half as much soda. To the white powder which results Berlioz has given the name of microcidin. While possessing feeble toxic qualities, the product is said to be a good antiseptic, easily soluble in water, and without odor or taste. While its antiseptic power is lower than that of bichloride of mercury and of naphthol, it is ten times that of carbolic acid and twenty-eight times that of boric acid. It is less toxic than naphthol. It is soluble in water, in the proportion of one to three. The remedy is not caustic, in the proportions in which it is to be employed; it is not irritating to wounds; it does not corrode instruments or destroy linen. It lowers normal and febrile temperature in animals, and is eliminated by the urine, upon which it confers the property of not decomposing. It may be used in proportions of 3 or 5 to 1000 parts of water.

Terebene, Terpine and Terpinol.—Terebene is isomeric with the essence of turpentine and is obtained by the action of sulphuric acid upon turpentine with distillation. As an antiseptic and disinfectant it is agreeable in odor and vaporized acts as a sedative and antiseptic in phthisis. Internally it is employed in capsules for the purpose of producing intestinal antisepsis and for the cure of dysentery. It is also sedative and antiseptic to the walls of the bladder when eliminated by the urine. It may be administered by inhalation in the steam of boiling water, or by the stomach in the form of tablets as follows:

℞.—Terebene	4 drachms.
Powdered gum arabic	4 "
Water	2 ounces.
Pulverized sugar	6 "
Powdered gum tragacanth	2 drachms.

Make into 100 tablets and administer one every four hours.

℞.—Terebene	4 drachms.
Pulverized gum arabic	4 "
Water	2 ounces.
Syrup of ginger	1 ounce.

Divide into 100 capsules.

Terpine is the hydrated essence of crystalline turpentine. It is obtained by bringing together four parts of essence of turpentine, three parts of alcohol and one part of nitric acid. After several weeks it forms in beautiful crystals. Terpine may be transformed in the presence of sulphuric acid into an oily body, terpinol. The therapeutical actions of terpine and terpinol are precisely those of the balsams, and these are, therefore, particularly useful in the treatment of catarrhal affections of the respiratory tract.

LEPINE has employed terpine as a substitute for turpentine, as an expectorant and diuretic, giving it in doses of from three to six grains. The influence of terpinol in cases of chronic bronchitis with profuse expectoration is very useful but the odor is somewhat disagreeable. Terpine may be given in the following manner:

℞.—Terpine	30 grains.
Glycerin	2 ounces.
Alcohol	2 "

Two teaspoonfuls each day.

Or it may be made into pills of which from four to five are given every twenty-four hours; or it may be placed in capsules in the dose of one to two grains. Terpinol may be given in capsules in the following manner:

℞.—Terpinol	15 grains.
Benzoate of sodium	15 "
Sugar, a sufficient quantity.	

—*Journal de Médecine de Paris.*

A Case of Poisoning by Aconitine.—In *La Médecine Moderne* a case is reported of a girl, aged twenty years, who had suffered from a violent attack of toothache, to relieve which aconitine in powder form was given. Immediately after its administration the patient was seized with violent colicky pains and in the course of a few hours died.

At the autopsy it was decided that the death was due to the aconitine, and after the testimony of Brouardel that the doses of the various aconitines is not known with certainty, the physician who prescribed the remedy was fined 100 francs. It was also pointed out that it is dangerous to prescribe aconitine without specifying the variety of aconitine which the physician wishes the druggist to dispense.

The Prophylaxis of Ophthalmia Neonatorum.—DEHENNE (*Journal de Médecine de Paris*, March 15, 1891) states that of one hundred blind persons forty-five have lost sight as a result of ophthalmia neonatorum. The gravity of this affection has been amply demonstrated. In hospitals in which rigorous antiseptic precautions are observed, before and during labor, ophthalmia of the newborn does not arise. Every purulent ophthalmia, carefully treated, ought to be cured. As a prophylactic measure, the eyes of the newborn infant should be washed with a 1:2000 solution of bichloride of mercury, or one drop of a 1:200 solution of nitrate of silver should be instilled into the eyes. If the lids are swollen, absorbent cotton saturated with ice-water should be applied. The cold can be maintained by placing bits of ice upon the cotton. The applications should be discontinued as soon as the swelling has disappeared. The lids should be washed about every hour with a 1:1000 solution of bichloride of mercury. Morning and evening, four or five drops of a solution of 1 part of neutral sulphate of eserine in 200 of distilled water should be instilled into each eye. Once a day the conjunctival surface of the lid should be gently brushed with a solution of nitrate of silver, 1:50. It is useless to apply stronger solutions. The solid stick must not be used, because it produces an eschar which, desquamating, opens the portals for the entrance of streptococci and gonococci.

Exstrophy of the Bladder and Epispadias.—BERGER (*L'Union Médicale*, April 30, 1891) presented to the Academy of Medicine an old man with exstrophy of the bladder and epispadias, in the case of whom, autoplasty failing, a strip of tissue was brought down from the abdominal wall to the opening in the urethra, the margins of which had been freshened. A large area of tissue was removed from the scrotum and applied to the exposed portion of the bladder. After two minor supplementary operations, the result was successful.

Congenital Hypertrophy of the Hand.—RICHARDIÈRE (*L'Union Médicale*, April 23, 1891) presented to the French Society of Dermatology and Syphilography a case of so-called pseudo-hypertrophy of the hand and fingers, the increase in size being due to an excessive development of the subcutaneous connective and adipose tissues. In true hypertrophy, the soft parts, the tendons, and the bones are all increased in size. In the false variety, the condition is perhaps one of diffuse lipomatosis.

Treatment of Nocturnal Incontinence of Urine in Children.—OLLIVIER (*L'Union Médicale*, April 21, 1891) recommends the introduction into the bladder of a small insulated sound tipped with a metallic button and connected with one pole of a battery, the other being applied to the pubes or the perineum. Weak currents are at first used. Twelve to fifteen applications are usually necessary to obtain a curative result. This treatment failing, belladonna or strychnine should be administered.

Treatment of Tuberculous Endometritis.—JOUIN recommends dilatation of the cavity of the uterus by means of a laminaria tent which has been placed for at least twelve hours in iodoform-ether, and, at intervals of several days, packing the uterus with iodoform gauze. Internally, creasote is administered. Sexual intercourse is interdicted until recovery is complete.—*L'Union Méd.*, April 28, 1891.

For Hay Asthma.—

℞.—Cocainæ hydrochlor. . . 1½ drachms.
Glycerini . . . . 3 fl. drachms.
Aquæ destil. . . . 5 "

Sig.—At the onset of the attack make two applications, with an interval of five minutes, by means of a brush, to the accessible nasal mucous membrane.

℞.—Cocainæ hydrochlor. . . ½ drachm.
Benzoini, pulv. . . . 1½ drachms.
Sacchari, pulv. . . . ½ drachm.

Sig.—Use as a snuff.
—*L'Union Méd.*, April 18, 1891.

For Herpes Genitalia.—(BESNIER.)

℞.—Acidi tannici . . ½ drachm.
Bismuthi subnitratis . 6 grains.
Pulvis amyli . . 12 drachms.

Sig.—Dust locally the region the seat of the herpes, after washing with dilute carbolized water. If ulceration exists, astringent dressings should be used. If the skin is dry, inunctions of vaseline should be used.—*L'Union Méd.*, April 25, 1891.

Cyanide of Gold.—Cyanide of gold is a yellowish, crystalline powder, without taste, insoluble in water, alcohol and ether. It has been given for the cure of scrofula, phthisis and amenorrhœa, in the following formula, by OESTERLEN. The dose is from $\frac{1}{50}$ to $\frac{1}{10}$ of a grain.

℞.—Cyanide of gold . . . 2 grains.
Chocolate . . . . 1½ ounces.

Make into twenty-five powders, and give from two to four each day.—*La Médecine Moderne.*

Treatment of Coryza.—

℞.—Salicylate of sodium } of each . ½ ounce.
Syrup of orange }
Peppermint water . . . 4 ounces.

At the onset of the attack a teaspoonful to a dessertspoonful should be given every three or four hours.—*Journ. de Méd. de Paris.*

Pilocarpine in Œdema of the Glottis.—MENDOZA (*La Semaine Médicale*, May 6, 1891) reported to the French Society of Otology and Laryngology the case of a young man with œdema of the glottis, in which two colleagues advised surgical interference. Detecting with the laryngoscope a small aperture in the midst of the swollen structures, Mendoza proposed the subcutaneous administration of pilocarpine. Accordingly, somewhat more than a third of a grain of the alkaloid was given in three doses, in the course of twenty minutes, with the happiest result. In the course of a week the patient had completely recovered.

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OF MEDICAL SCIENCE.

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SATURDAY, MAY 30, 1891.

AN EDITORIAL CHANGE.

WITH the issue of THE MEDICAL NEWS for June 6th, the editorial management will pass into the hands of Dr. George M. Gould, of Philadelphia. In succeeding to the editorial chair Dr. Gould brings not merely a well-won reputation for both literary and medical training, but also an experience which amply guarantees that THE NEWS will well maintain its character as a periodical devoted to the highest interest of practical medicine.

The retiring editor desires to thank those who have contributed to the columns of THE MEDICAL NEWS, not only for their valuable articles, but also for the kindly courtesy which they have invariably shown him—a courtesy which he is confident will be extended to his successor.

THE UNIVERSITY OF PENNSYLVANIA AND HIGHER MEDICAL EDUCATION.

ON May 21st Dr. Pepper submitted to the Board of Trustees and the Medical Faculty of the University of Pennsylvania a proposition to subscribe on his part the sum of $50,000 toward a permanent endowment fund of $250,000, and also for five years the sum of $1000 annually toward a guarantee fund of $20,000 per annum. These propositions were conditioned upon the completion of the subscription to the endowment and guarantee funds before January 1, 1893, and upon other minor matters of detail, but principally upon the decision and announcement of the University before June 1, 1891, that a four-year obligatory course of medical study should be established on or before September 1, 1893.

There can be but one opinion concerning this generous and vigorous action of Dr. Pepper. The movement deserves the most unqualified support of all, and it is to be hoped that the necessary amounts may be subscribed in a short time. We understand it was reported at the meeting that the Medical Faculty had contributed about $10,000 of the entire guarantee fund, and that the conditions would in time be fulfilled.

The principal object aimed at—the four-year obligatory graded course—is one that deserves the sympathy of all. It has of late become more and more evident that two, and even three, years of preliminary study are insufficient to worthily and adequately equip young men for the best work in the medical profession. The multiplication of post-graduate courses of study, the efforts to raise the standard of admission, the painful unfitness of many graduates for the duties of their work, have served to bring the want more plainly before the mind. Why not do the preparatory work before, rather than after, graduation? Experience and learning are far more readily acquired under the eye of trained teachers than when the physician is placed in charge of those whose lives depend on his ability to deal with disease.

The generosity of Dr. Pepper and his associates will again advance the University in her proud office of leader in scientific and progressive medicine in the United States. It is in this spirit that men work who are conscious of the high import of the interests confided to their care and of the profound rôle scientific medicine has to play in modern life.

There is the greatest difference between being driven by an aroused public sentiment, or drawn by a shrewd self-interest, into taking a hazardous stride forward, and this other way of bravely placing the standard in advance, and with determination bracing oneself to a purpose of realization of one's own ideal whilst calling upon the laggard world to "come up higher." Provost Pepper and his fellow-workers have chosen the latter plan, and our profession has the best reason to congratulate itself and to pray for its speedy realization. But such

an actualization depends upon each of us—in part, even upon the humblest—and everyone should take to himself the admonition to give—if not money, what is often of greater value—his word of encouragement and his lift of helpfulness. Toward this end THE MEDICAL NEWS would most heartily signify its good-will by calling the attention of its many readers to this proof of noble enthusiasm, and by asking everyone to contribute his mite, each in his chosen way.

REVIEWS.

MEDICAL JURISPRUDENCE AND TOXICOLOGY. By JOHN J. REESE, M.D. Third edition. Philadelphia: P. Blakiston & Son, 1891.

WE are glad to find that Dr. Reese has seen fit to enlarge and add to the already valuable material in this work the latest decisions and advances in medico-legal matters. The interest of the public at large, as well as of physicians, in medical expert testimony has been stirred to its depths lately by the numerous criminal trials in which prominent practitioners have been engaged. Unfortunately in many of our medical schools this important subject is too often given a very secondary position in the curriculum, so that such a standard text-book as the volume in question is an absolute necessity to the physician. The author explains thoroughly, in the opening chapters, the duties of the physician in medico-legal cases. He describes the observations he should make, the proper method of arranging and preserving such information, and to what, and how, a physician should testify in court. He points out the difference between the position occupied by the physician who is a witness merely as to facts, and his who is called to give expert testimony. Of the two, very different questions are to be asked, and Dr. Reese denounces the methods of cross-examination now so much in vogue.

Then follow chapters upon the signs of death and the detection of the immediate cause, and directions to be followed in making a post-mortem. Chapters on poisoning, feigned disease, pregnancy, criminal abortion, rape, insanity, and malpractice bring the book to a conclusion.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY FOR 1890. Edited by HENRY C. COE, M.D. Philadelphia: Wm. J. Dornan, 1891.

THE volume before us contains the minutes and papers read at the fifteenth annual meeting of the Society, which was held at Buffalo, N. Y., in September last. A careful perusal of the many papers read, with the accompanying discussions, cannot fail to be of interest to all physicians, whether they be gynecologists or not. The elaborate research exhibited in the paper upon "Subpericranial Blood-tumor of the Newborn," by Dr. H. A. Kelly, is instructive in the highest degree. Dr. J. M. Baldy makes a most welcome contribution to our knowledge of the "Diagnosis and Treatment of Early Ectopic Gestation," in a paper which places clearly before one the various symptoms of extra-uterine pregnancy, and urges forcibly the necessity of prompt operative interference. Other papers are contributed by such well-known authorities as Drs. Skeene, Coe, H. T. Byford, Jenks, and Reynolds.

SOCIETY PROCEEDINGS.

THE AMERICAN MEDICAL ASSOCIATION.

Forty-second Annual Meeting, held at Washington, D. C., May 5, 6, 7, 8, 1891.

[Continued from page 592]

THIRD DAY.—SECTION OF GYNECOLOGY AND OBSTETRICS.

The important subject of the "Comparative Merits of the Electrical and Surgical Treatment in Cases of Uterine Myomata" formed the topic for discussion in the Section of Obstetrics and Gynecology on Thursday morning, May 7th.

DR. MASSEY, of Philadelphia, opened the discussion with a paper narrating his results in the treatment of thirty-nine cases by electricity. His methods were those employed by Apostoli, with the exception that he seldom made deep punctures, but confined the insertion of his needle to a distance of about one-third of an inch. He reported five cases as cured, twenty-three cases of smaller tumors lessened in size, eight cases in which symptoms were relieved, two cases in which nothing was accomplished, and one case made worse by the treatment. His percentage of cures was 12.8; about three-fourths of the cases had their symptoms relieved; and in the two cases in which he failed to produce any effect, the tumors were inaccessible without danger to the patient. The case in which the failure of electrical treatment was followed by which injury was done was that of a fibro-cystic tumor, in an attempt to remove the tumor piecemeal, which ended in septic infection and death. His method of making punctures is that known as buried punctures, the needle being insulated with rubber to a point one inch from its extremity. The tissues, after such puncture, healed rapidly and without reaction. He exhibited electrodes tipped with platinum, some of them elastic and coated with shellac, which allowed disinfection with the alcohol lamp; he also presented a current-controller. It is his custom to allow five or seven days to elapse between intra-uterine applications. He had found benefit also from vagino-abdominal applications. In conclusion, he urged that a better knowledge of the successes of surgical operation in these cases is demanded before a fair comparison can be made between surgical and electrical treatment.

As a criticism upon the claims made by electricians, DR. WERNER, of Philadelphia, read a statistical paper, claiming a superiority for surgical over electrical treatment, and narrated the case of a patient having a multinodular tumor from whom she removed the ovaries to check hæmorrhage; this persisting, however, owing to the presence of submucous growths, these were removed, when the hæmorrhage ceased.

Electricity was also championed by DR. MARTIN, of Chicago, who confined himself to assertions based upon

an experience with two hundred and fifty cases, from which he claimed that 75 per cent. of fibroid tumors of the uterus can be cured or improved by electricity, while 25 per cent. demanded operations. He had found that surgical treatment was necessary in cases in which he could not insert an electrode within the uterus without danger to the patient. (Dr. Martin was upon the programme for a paper upon electrical treatment, but made brief remarks instead.)

Another advocate of electricity, Dr. Bigelow, of Philadelphia, failed to put in an appearance, hence that side of the argument was represented largely by Dr. Massey. The surgical aspect of the question was opened by DR. EASTMAN, of Indianapolis, who described and illustrated his method of performing supra-pubic hysterectomy. After abdominal section he compresses the uterus and tumor by an elastic bandage secured by large pins put through the capsule; the uterus is then opened and the tumor enucleated. A large staff, devised by him, being passed from below to serve as a guide, the peritoneum is then stitched over the stump, the actual cautery having been used to sear the interior of the uterus to prevent its contents from escaping into the peritoneal cavity. He had performed these operations successfully in nineteen cases, and had met three cases in which the relations of the tissues were such that no pedicle could be formed. In his method of performing vaginal extirpation of the uterus, Dr. Eastman places the patient in Sims's position, securing the uterine arteries by a ligature passed with a large curved needle. He prefers the ligature to the application of compressing forceps, and brings the stumps of the broad ligaments, as far as possible, outside the peritoneum. He also exhibited vulsella forceps of large size, devised by him for grasping large tumors.

Three hysterectomies were reported by DR. OPIE, of Baltimore. Clamps were used to secure the pedicle. Two of the cases recovered and one, having a fibro-cystic tumor, died. Dr. Opie had given electricity a faithful trial for several years, but had observed no other result than an occasional cessation of hæmorrhage and an improvement in general health. He advised operation in all cases in which fluctuation is present.

DR. JOSEPH PRICE, of Philadephila, read a paper giving the details of fifty-three cases of hysterectomy, with three deaths. This paper will soon appear in full in THE MEDICAL NEWS.

DR. FLORIAN KRUG, of New York, did not believe that large fibroids could be successfully treated by electricity. He believed the best operative procedure to be total extirpation of the uterus and tumor, leaving no stump. He had found Trendelenburg's posture an aid in all abdominal operations; in feeble patients it did much to prevent anæmia of the brain. He requires for such operations only scissors, scalpel, aneurism-needle with ligature-needle, and ligature ordinarily employed. The finger of an assistant takes the place of the staff employed by Dr. Eastman; he often performed operations in thirty minutes—a difficult case requiring an hour. The ligatures and iodoform gauze used as dressing are brought out through the vagina. The gauze is left in for a week without danger; the bowels are moved on the day following operation. Dr. Krug considers the ligature much better than the clamp for checking bleeding.

From the standpoint of surgery, DR. BALDY argued that most cases of uterine fibroids need no treatment. Several agencies will relieve pain caused by such tumors, among these being various drugs and electricity. When a patient will not consent to a radical cure by operation, he advises palliative treatment, and in operating he much prefers the extra-peritoneal method of treating stumps.

An interesting case, showing an unusual result of electrical treatment, was narrated by DR. FRY, of Washington. After the use of the galvanic current, the current strength ranging from 85 to 200 milliampères, severe uterine contractions caused the expulsion of a piece of the tumor, eight inches in length; this was followed by septic infection.

The question under discussion was ably summarized by DR. SKENE, of Brooklyn, who pointed out the fact that the remedy should be chosen with reference to each individual case, whether that remedy be electricity or surgical operation. What is most needed is careful study in diagnosis, that proper discrimination may be exercised in the choice of remedies for different cases. We have not yet sufficient information to decide positively as to the comparative merits of the two agents; electricity will control many cases, especially if applied early, and operation can thus be avoided. The dangers attending the use of electricity are constantly becoming less; punctures can probably be avoided, thus eliminating one of the greatest sources of danger. It is a very significant fact that at present the death-rate from surgical operation in these cases is higher than the death-rate of cases which are not treated at all.

The most interesting contributions of the afternoon session on May 7th were the papers of Dr. Polk, of New York, describing "Operations for the Preservation of the Uterine Appendages;" an interesting paper by Dr. Skene on the "Treatment of Chronic Ovaritis;" and a study by Dr. J. W. Williams, of Baltimore, upon the "Structure of the Fallopian Tube." For the full text of Dr. Skene's paper the reader is referred to a later issue of THE MEDICAL NEWS.

DR. POLK reported forty-nine cases of disease involving the uterine appendages in which an effort was made to avoid their removal. In the majority of these cases the operations resulted in benefit. In fourteen cases in which the tubes were very adherent, the adhesions were broken up much to the patients' advantage. In three cases, after abdominal section, an exploratory incision into the ovary was made, and the patient subsequently improved in health. In four cases in which the ovaries were found very highly congested and displaced, they were suspended by sutures in their proper positions, and the congestion was relieved. In five cases small cysts in the ovaries were incised and emptied; an improvement in the patient's health followed. Four cases of resection of the tubes were described. Dr. Polk believes that if the ovary is sound and the tube is affected, it is advisable to resect the diseased portion of the tube, stitching the extremity in the vicinity of the ovary. In two such cases pregnancy and labor had occurred after the operation, and a good result had been obtained.

The paper of DR. WILLIAMS was illustrated by drawings of the microscopic anatomy of the tubes, demonstrating that the mucous lining contains but one layer of epithelial cells arranged in longitudinal folds. Three layers of muscular tissue exist, and at some points in the tube diverticula are found in which an ovum may lodge, favoring the development of ectopic gestation. Dr. Williams also showed that during fœtal life the tubes are twisted upon themselves, and that this condition in adult life may account for sterility and favor pyosalpinx.

As an interesting contribution to our knowledge of ectopic gestation, DR. FORMAD, of Philadelphia, exhibited photographs, and stated the result of 3500 post-mortem examinations, in which he had found thirty-five cases of ectopic pregnancy. The women were multiparæ, between twenty and forty years of age; were conscious that they were pregnant; and in all cases chronic inflammation of the tubes was present. Thirty-one of the cases showed ruptured ectopic gestation-cysts in the abdominal cavity; three were cases of interstitial pregnancy, and one was ovarian. In every case, severe mental or physical disturbance was followed by shock, pain, and bleeding; the amount of blood found in the abdomen varied from a pint to two gallons. All of the women were in early pregnancy between the first and third month. Dr. Formad considers ruptured ectopic gestation to be the only cause of hæmatocele.

In the discussion of these papers, it was agreed that the diagnosis of chronic ovaritis is practically impossible, except by microscopic examination. A tube in which purulent inflammation exists can never be useful, and should be removed; operation, however, should be followed by thorough constitutional treatment, especially addressed to the nervous system. Pain after operation is sometimes relieved by hot douches and the use of electricity. The drift of general opinion was decidedly against the removal of the tubes and ovaries for neuroses only.

"Minor Gynecology" was the subject of a paper by DR. BALDY, of Philadelphia, in which it was shown that the modern pathology of pelvic disease rendered irrational many minor operations formerly often performed.

The merits of the vaginal tampon were discussed by DR. SELLMAN, of Baltimore. Many uses of the tampon the speaker discouraged as useless and harmful, especially urging that the duty of the physician is to remove the cause of hæmorrhage rather than to seek to dam up the blood in the uterus by a tampon. Tampons interfere with the functions of the bladder and rectum, and sometimes result in forcing secretions backward through the tubes into the peritoneal cavity. They are useful to limit an agent applied to the interior of the uterus from coming in contact with the external parts; they are useful also in cases of scanty secretion; they are unreliable in the treatment of displacements, although the three tampons suggested by Mundé are sometimes very effective.

In the discussion upon minor gynecology, Dr. Sutton, of Pittsburg, believed in operating upon lacerated cervices when they cause suffering, and when there is no disease of the appendages. He believed that a lacerated cervix predisposes to cancer; he favored also the use of the dull curette, and had seen nothing but benefit from the use of iodoform gauze as a tampon, which could remain from seven to ten days with safety.

The only paper bearing directly upon obstetric practice was one read by Dr. BERNARDY, of Philadelphia, in which he described his experience in the treatment of posterior positions in face presentations. The danger of impaction was demonstrated and explained, and the treatment suggested was version when the chin was still as high as the brim of the pelvis, or craniotomy as soon as impaction occurred.

In the closing session on Friday morning, May 8th, DR. HUMISTON, of Cleveland, read a paper upon "The Use of Cocaine in Gynecology." He first administers a half ounce of whiskey to his patients, and then injects the site of operation with from fifteen to forty minims of a 4 per cent. solution. He had recently performed an extensive plastic operation, lasting an hour, with the use of three grains of cocaine. His operations are done under strictly aseptic precautions. Union by first intention was the rule. In the discussion of this paper the prevalent opinion was adverse to the claims of cocaine as a reliable anæsthetic, there being danger of constitutional poisoning, interference with union by first intention, and failure to control the pain.

A paper of value, describing studies in the infection of drainage-tubes carried on at the Johns Hopkins Hospital, was read by DR. ROBB. Sixteen cases were studied by inoculation of culture materials with fluid obtained from drainage-tubes. In nine cases no infection resulted; in six cases bacteria of but feeble power were found, while in one case septic infection and the formation of pus occurred. The principle of treatment advised consists in carefully guarding the orifice of the drainage-tube and excluding every source of external contagion. The tube is emptied, not by a syringe, but by bits of baked cotton handled by a slender sterilized forceps.

A simple and remarkably efficient tube devised for drainage was shown by DR. R. T. MORRIS, of New York. It consisted of a narrow strip of gauze covered by a band of protective material, in which many holes had been cut, and rolled to form a long wicking. When it is necessary to inject antiseptic fluids through the drainage-tube, a soft rubber tube is placed in the centre, and the other is rolled about it. Both varieties of tube were not likely to leave fistulæ, and had been found very efficient.

The remainder of the morning was occupied by papers upon "Peritonitis after Operation," by DR. SHIMWELL, of Philadelphia, and by DR. C. R. READ, of Ohio, upon "The Palliative Treatment of Cancer of the Uterus."

A general discussion upon the question of Antisepsis *versus* Cleanliness, showed that operators relied upon both, recognizing fully the importance of such studies as those of Dr. Robb.

The opinion was also expressed that operations of magnitude should be confined to specialists, and not entrusted to incompetent practitioners.

As a matter of business, it was said that seventy papers had been presented to the Chairman and Secretary of the Section, of which twenty had been excluded as manifestly unfit to be read; a resolution was therefore offered by Dr. Opie, that in future papers be limited to forty, and that the Chairman be empowered to make

such selection of papers as he deemed most advantageous for the Section. The Chairman was congratulated upon the programme which he had offered to the Section, and, in return, thanked its members for the courtesy and kind assistance which they had shown him; after which the Section adjourned.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, May 7, 1891.

ALFRED L. LOOMIS, M.D., IN THE CHAIR.

OBSERVATIONS ON THE USE OF KOCH'S TUBERCULIN IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

THE discussion was opened by Dr. Francis P. Kinnicutt with a report of his observations at St. Luke's Hospital. Forty-two patients were under his personal supervision in connection with this treatment, 13 of which were cases of pulmonary tuberculosis; in 6 of these there was tuberculosis of the larynx, of greater or less severity. The only point in the technique to which he specially called attention was the necessity of employing fresh solutions of Koch's fluid, as experience had shown that the carbolic acid solutions deteriorated by keeping. The initial dose for adults did not exceed one milligramme; at first the severity and duration of the general and local reaction was taken as the guide to the frequency of the re-inoculations, but later on it was found better to await the subsidence of the physical reactions and to study more closely the idiosyncrasies which presented themselves. Gradual destruction, separation and elimination, or encapsulation were the steps of Nature's process of repair, and it was reasonable to expect that imitation of this process would give the best results.

Dr. Kinnicutt divided his cases into three groups, viz.: (1) those showing a notable improvement in the pulmonary and general condition; (2) those showing no improvement, or improvement in certain respects only; (3) those cases in which there was either a distinct deterioration in the patient's condition, or in which the progress of the disease continued unchecked. The first group consisted of five cases. In one of these, the daily quantity of sputum was only half an ounce; a careful examination by Dr. Prudden failed to detect the bacilli *before* the inoculations were begun, but during the treatment they were found. In all the cases, the bacilli gradually diminished in number and finally disappeared. The examinations of the sputa were made by Dr. T. M. Prudden, who mixed the whole quantity for the twenty-four hours with a saturated solution of borax, and allowed it to stand for twenty-four hours, with occasional vigorous shakings. One cubic centimetre was taken as the unit of measure. In the records of the number of bacilli found in the various cases, it should be remembered that a very large number of bacilli to one cubic centimetre does not mean very many to a cover-glass; thus: 400,000 bacilli to one cubic centimetre represents only 80 bacilli under a cover-glass, or in forty fields, and 500 bacilli in one cubic centimetre represents only one bacillus under a cover-glass. Three of the five cases were discharged after eleven, thirteen, and sixteen weeks of treatment respectively. Two of them had gained four pounds, and one eleven pounds, the sputa and cough being practically absent, and the temperature normal. The two remaining cases are still under treatment in the hospital. None of these cases had hæmoptysis, although two had had copious hæmorrhages just before admission. The diminution in the degree of dulness, and a more nearly normal character of the respiratory murmur may result from the disappearance of the intra-alveolar exudation, and not from destruction of the intra-alveolar tubercular tissue—the two prominent factors in pulmonary tuberculosis. The improvement in these five cases was more marked than in the other cases. These patients received cod-liver oil and creasote, or both, during the greater part of the treatment, but this medication had been used previously to the inoculations without benefit, one of the cases having been under this treatment for a year.

The second group comprised four cases. One of these for many weeks showed the least constitutional tolerance to the fluid inoculations which were usually accompanied by much constitutional disturbance. After the first two weeks, the cough was markedly diminished and the sputum was reduced from two ounces to one or two drachms in the twenty-four hours, and the bacilli from 650 to 120 in a cover-glass, or forty fields. The afternoon rise of temperature was much smaller, and the patient gained in flesh, but the physical signs in the lungs and in the larynx remained unchanged. When the report was made, the disease in the larynx had made notable progress, the sputum and bacilli were increased, the patient was losing weight, and his fever had returned.

In the third group of four cases, one of cardiac and renal disease, with infiltration at one apex, is interesting. Reaction followed the second inoculation of two milligrammes, but the albumin in the urine was at once increased, and red blood-corpuscles and hyaline and granular casts appeared in the urine. After the fourth inoculation of two and one-half milligrammes there was headache and obstinate vomiting, with the physical signs of pleuro-pericarditis. After stopping the inoculations, the symptoms and signs gradually declined to the point found on admission. In a second case in which there was infiltration at both apices, and also infiltration of the inter-arytenoid commissure, the first injection of one-half a milligramme caused general reaction and slight epistaxis, and after the second, of two milligrammes, there was slight tenderness and pain in the right iliac region. On Feb. 8th, an injection of four milligrammes produced all the signs of an appendicitis. Under the free use of morphine and poultices the symptoms gradually abated. Within the past few days, there had been a slight recurrence of the appendicitis. The pulmonary signs remained almost unchanged. In a third case in this group, the physical signs on admission pointed to slight infiltration at the left apex, and the existence of laryngeal disease was doubtful. There was a slight evening rise of temperature for the three days preceding the inoculations that the patient was under observation; bacilli were present. Reaction followed injection of one milligramme, and there was abundant moist crepitation over the first and second interspaces and inter-clavicular region, and distinctly diminished resonance over the same areas. Similar phenomena were noticed in many other cases, and were thought to be due to a transitory local hyperæmia, though in the case in question these

signs did not disappear, but rubbing and creaking sounds were heard, indicating the involvement of the pleura, and there was also a small area of fine moist crepitation over the scapular region of the opposite side. In view of this, and the patient's low vitality, no inoculations were given after the maximum dose of two milligrammes had been reached. Subsequently there were signs of two small cavities in the inter-clavicular region. Either a massive catarrhal or caseous hepatization, Dr. Kinnicutt thought, followed the inoculations, and it was the only case in his series in which such lesions occurred.

After a five months' experience with tuberculin, Dr. Kinnicutt concludes that the diagnostic value of this remedy is only relative, that small doses at long intervals should be advised, and that the beneficial effects are restricted to pulmonary disease in its early stages. Local reactions may be developed in the entire absence of constitutional effects as indicated by the temperature. Tuberculin is apparently capable of exciting pneumonic processes of varying degrees of intensity. He was of the opinion that tuberculin is capable in the early stages of pulmonary tuberculosis of effecting greater improvement in the physical condition than has been observed under any other method of purely medical treatment, but he thought its best effects would only be found when it is used in conjunction with the other methods of treatment.

The discussion was continued by the President, Dr. A. L. Loomis, with a summary of the results obtained by him at Bellevue Hospital. Thirteen cases of pulmonary tuberculosis were treated by this method, eight being in the stage of consolidation, two in the stage of consolidation with softening, and three in the stage of softening with excavation. The average dose was 1.9 milligrammes, and the largest number of injections was seventy-seven. The condition of every one of these patients was improved, and the average gain in weight was eight and one-half pounds. In every case the first injection was followed by evidences of increased activity of the process in the lungs, but at the end of the third week the affected areas would usually present an arrest of the disease. In the third class, the average duration of the treatment was eleven weeks, the average dose 0.7 milligramme, and the average gain in weight nine pounds. In all of these cases, the pathological process became much more active, and in one there was an extension of the disease. His experience had taught him that tuberculin was an agent which was capable of exciting active changes in the tubercular areas, the nature and extent of which depended upon the dose and the frequency of the injections. He knew of no method which so effectually maintained the nutritive processes in these patients as the treatment with the pneumatic cabinet, as advocated by Dr. Quimby. The number of bacilli diminished but never disappeared, yet this was not important, as he had known cases which had been cured by the climatic treatment for many years to have bacilli in their sputa, although they appeared to be in perfect health.

DR. H. N. HEINEMAN reported the results of his observations on twenty-two cases of pulmonary phthisis at Mt. Sinai Hospital. In one case of chronic fibroid phthisis, after the treatment had been discontinued for several weeks, the patient had for the first time a pulmonary hæmorrhage, and in two other cases hæmorrhages were brought on by small injections of tuberculin. In another case, having cavities and a tuberculous testicle, the tuberculous process in the testicle became so active that it was necessary to remove the organ in four weeks, when it was found to be the seat of extensive tubercular deposits. The presence of cardiac or renal disease should be considered a positive contra-indication to the use of tuberculin, for the albuminuria is always increased by such treatment, and in one fatal case he believed that the tuberculin had been the cause of the parenchymatous nephritis.

A paper by DR. E. L. TRUDEAU, containing the results of his observations on tuberculin in the Adirondack Sanitarium, was, in the absence of its author, read by Dr. Quimby. He had treated eight cases with this remedy in conjunction with the climatic, hygienic, and medicinal measures usually employed at his sanitarium. Six of these cases also received treatment in the pneumatic cabinet. The injections were given twice a week, and the dose was so adjusted as to produce very little reaction. One woman with miliary tuberculosis at both apices became much worse after the injections. Small doses excited such violent constitutional reaction that at one time the temperature reached 104.5° and the pulse 160. One case was apparently cured, four were greatly improved, two were unimproved, and one was apparently injured by the treatment. He thought that the changes in the physical signs supported Koch's assumption as to the specific action of the fluid upon the phthisical process, but that it was not likely that tuberculin could confer immunity against further infection.

DR. C. E. QUIMBY had treated six cases with tuberculin, combined with the use of the pneumatic cabinet. The cabinet secured expansion of the lungs and removal of catarrhal products; the tuberculin set up specific processes in the lungs, and then the pneumatic cabinet was employed to favor absorption during the stage of activity. In one case, each injection increased the inflammatory changes in the lungs, but these rapidly improved under treatment with the cabinet. Four out of the six cases had hæmorrhages. Strangely enough, none of his patients developed a tolerance for the tuberculin. He thought the remedy was chiefly indicated when the reparative processes were adynamic.

The general discussion was opened by DR. A. JACOBI, who said that he had already spoken upon this subject before the State Medical Society. He advocated the use of small doses, since the best therapeutic effects were obtained with these. As an instance of the impossibility of predicting the effect of the tuberculin in any given case, he related the following remarkable case: The patient, a lady about forty years of age, had had tuberculosis for at least ten years; she had had tubercular tumors in the abdominal cavity, had expectorated an unusual quantity of pus, and had suffered a long time from night-sweats. There were two large cavities in the lungs, and the sputum contained numerous bacilli. In the early part of the winter she had a pneumonia, from which she recovered; and about January 10th her husband, a physician, began to treat her with tuberculin. The first dose of one milligramme was followed by no reaction, and this was increased one milligramme each day until she received about forty milligrammes,

and still no reaction occurred. The dose was then increased by two or three milligrammes daily, until about ten days ago, she was receiving 350 milligrammes daily. Although the usual reaction was not produced, it was noticed that shortly after each injection her temperature fell, and remained low for eight or ten hours. Expectoration at first became more abundant, but it soon diminished and the number of bacilli grew less, the night-sweats and fever disappeared, and the patient began to gain flesh. At present the cavities are decidedly smaller than before the treatment. In general, the treatment of surgical tuberculosis had been disappointing. He thought that the best treatment hereafter for pulmonary tuberculosis would be a combination of the climatic treatment with the careful use of tuberculin.

DR. E. C. WENDT had employed tuberculin in 38 cases —4 of surgical tuberculosis, 7 of phthisis, 22 of "strumous condition," chiefly children with adenitis, 4 of ordinary bronchitis, and in one healthy person. In *every* case a febrile reaction was obtained, which would seem to throw much doubt upon the correctness of Koch's claim as to its diagnostic value. There was but little improvement in the four surgical cases, and although the general condition of the phthisical patients was improved, the physical signs remained unchanged. In the "strumous" cases the anæmia improved, but there was no effect upon the glands or upon the harsh respiration. The initial dose was invariably one-fourth of a milligramme.

DR. S. BARUCH had employed this remedy in sixteen cases, and he detailed the histories of two which appeared to have been cured by this treatment. He thought tuberculin had some diagnostic value, and that when cavities existed it was undoubtedly beneficial.

DR. H. S. STEARNS continued the discussion by referring to the results of two autopsies upon cases in Bellevue Hospital which died while under his treatment. The lungs were filled with recent minute miliary tubercles, and there was also general tubercular infiltration of the abdominal viscera.

In answer to a question from one of the Fellows, who had noticed a marked acceleration of the pulse and a deepening of the respirations after the injections, Dr. Kinnicutt said that he had not noticed this peculiar feature in his cases.

THE PRESIDENT said that he had seen one such case, and so marked was the susceptibility that a dose of one-tenth of a milligramme brought on symptoms of collapse. He added that the discussion seemed to show that in tuberculin we had an agent, powerful for good or evil, and one requiring more care and more experience than any other remedy which had been given to us for the treatment of tuberculosis, but he thought it would take a permanent place in the treatment of pulmonary tuberculosis and would enable us to save many lives.

CORRESPONDENCE.

BALTIMORE.

THE Ninety-third Annual Convention of the Medical and Chirurgical Faculty of Maryland (the State Medical Society) has just come to a close. The convention was opened on Tuesday, April 28th, by an address from the President, Dr. Thomas A. Ashby, who has, in addition to his practical work in medicine, done excellent service to his profession as editor of the *Maryland Medical Journal* and, later, as one of the most ardent promoters of the extension of the faculty's influence in this State. His address, entitled "The Relation of the Medical and Chirurgical Faculty to Professional Organization in Maryland," was an able review of the struggles of the faculty against the obstacles which beset its pathway during its existence of nearly a century, and of the present attainments and future possibilities of this great and now active State medical organization. The attendance at the opening of the session was larger than usual, and those who had the faculty's interests at heart felt that there was unusual enthusiasm and interest in its affairs.

The Society met again in the evening, when the reports of "sections" were taken up. A paper was read by Dr. Joseph T. Smith on "The Treatment of Diphtheria," giving a summary of the methods and agents which may be most safely trusted in the battle with this dreaded scourge; and another by Dr. J. E. Michael on "Obstetrical Antisepsis" as employed in the lying-in hospital under his charge. The earnest discussions which followed the reading of these papers, and of others which were presented, were in pleasing contrast to the apathy which has characterized some of the previous conventions. Evening sessions are a new feature in the faculty's work, having been introduced at this time for the purpose of economizing the time of country practitioners who desire to stay in the city during the days of the convention. They have been quite a success, and are likely to take a permanent place on the programmes of future annual conventions.

The central point of interest in the morning session of Wednesday was the delivery, by Professor William Welch, of the Johns Hopkins Pathological Laboratory, of the annual oration, on "The Causation of Diphtheria," which was listened to with profound interest by a large audience, and appeared in THE MEDICAL NEWS of May 16th.

The rest of the morning was spent in listening to reports of sections. The evening session was taken up by the election of officers for the ensuing year. The nomination of the orator of the morning for President was unexpected by many of those present, but it was at once apparent from its reception that the profession of the city appreciated most highly not only the services which Prof. Welch had rendered to medicine, but the uniform courtesy and modesty, and the interest in local medical affairs, which has made him among them the most popular of the corps of medical men attached to the Johns Hopkins Hospital. It is to be hoped that the election of Prof. Welch to this, the highest gift which the profession can confer, will strengthen the ties between the physicians of Baltimore and the Faculty of the Johns Hopkins medical foundation.

The third (and last) day of the convention was spent in the delivery of reports of different "sections," and in the reading of voluntary papers, a morning and evening session being held as before.

Two prominent members of the faculty have been removed by death since the last convention: Dr.

Richard Gundry, Superintendent of the Maryland State Asylum for the Insane, and Professor of Materia Medica, Therapeutics, and Mental Diseases in the College of Physicians and Surgeons of Baltimore, and Dr. John R. Quinan, author of the "Medical Annals of Baltimore." It is doubtful if the State has any available man to fill Dr. Gundry's position. Dr. Quinan belonged to a class of physicians rich in medical lore and devoted to literary research, which is never a large one in any community.

Taken as a whole, the convention just ended has been unusually successful. The only drawback has been the absence of many country members who might have honored it with their presence. The audience which assembled to hear Prof. Welch's "Annual Address" was the largest known to members who have served the faculty through middle life into old age, and it filled to overflowing the spacious hall of the faculty. Nor was the interest limited to this occasion, for the "President's Address" attracted a full audience, and all of the exercises have been unusually well attended.

The printing of carefully-arranged programmes of the convention, and the timely distribution of the same, was a very desirable improvement.

The outlook for medicine in Maryland is certainly encouraging, notwithstanding the dishonor which has been brought upon it in past years through the jealousy of factions and the rapacity of representatives in public offices.

The printed *Transactions* of the faculty for 1890–91, containing, in addition to the papers already mentioned, articles by Prof. Newell Martin on "The Changes Wrought in Nerve Ganglia by Prolonged Stimulation;" by Dr. Hiram Woods on "The Need of State Intervention for the Prevention of Blindness from Ophthalmia Neonatorum" (which led to the appointment of two oculists and two obstetricians as a committee of the faculty to report upon the subject); and by Dr. Chisolm on "Diseases of the Eye in the Fœtus;" together with many other communications read at the present meeting and at the semi-annual meeting in the past autumn, promise to be unusually full of interest to all practitioners.

NEWS ITEMS.

The Kashmir Medical Mission.—One of the most interesting of medical mission stations is that in the Vale of Kashmir, conducted by the two brothers, Drs. Arthur and Ernest F. Neve, both of them graduates since 1881, from Edinburgh. Their contributions are not infrequently seen in our American medical journals. Their report of last year's work shows a total of 2558 surgical cases, of which about 1000 involved eye operations. Most of these were minor cases, but often important as regards the future eyesight of the patients. Eight deaths followed surgical treatment; of these, three had no bearing upon the operation. A new block of wards has been added to the hospital for the accommodation of twenty additional patients, and is the best, as well as the newest. Its cost has been about $800. The location of this hospital is at Srinagar, the capital of Kashmir, with an altitude of 5235 feet above the sea, and in a section not yet approached by railroads.

Patients come to Srinagar from all parts of Central Asia, sometimes fifteen to twenty days' journey distant to the north and east, which sections are virtually unexplored by Europeans. A majority of the in-patients come from a distance, and the missionaries are taxed to find support for them, as well as to furnish them treatment and shelter in very many instances. A woman's hospital will be built at Srinagar, with room for thirty patients.

The Climatologist.—Under the name of *The Climatologist*, a monthly journal devoted to the study of climatology will be published in Colorado Springs, Colorado, under the editorial supervision of Dr. Keating, of Philadelphia, Dr. Gardiner, of Colorado Springs, and Dr. Griffith, of Philadelphia. A distinguished list of collaborateurs has been engaged, among whom may be mentioned Drs. J. M. Da Costa, A. L. Loomis, William Pepper, E. L. Trudeau, and W. A. Edwards.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM MAY 19 TO MAY 25, 1891.

By direction of the Secretary of War, the following assignments of recently-appointed Medical Officers were ordered:

LIPPITT, WILLIAM F., JR., *First Lieutenant and Assistant Surgeon.*—Will report in person, for duty, to the commanding officer Fort McPherson, Ga.

BROOKE, BENJAMIN, *First Lieutenant and Assistant Surgeon.*—Will report in person to the commanding officer Fort Riley, Kansas.

IRELAND, MERRITT W., *First Lieutenant and Assistant Surgeon.*—Will proceed from Columbia City, Ind., to Jefferson Barracks, Mo., and report in person, for duty, to commanding officer of that post.

WELLS, GEORGE M., *First Lieutenant and Assistant Surgeon.*—Will proceed from Paoli, Ind., to Columbus Barracks, Ohio, and report in person, for duty, to the commanding officer of that post.—Par. 7, *S. O. 115, A. G. O.*, May 20, 1891.

WOOD, MARSHALL W., *Captain and Assistant Surgeon.*—Is hereby granted leave of absence for one month, to commence on or about the 23d instant.—Par. 1, *S. O. 104, Division of the Atlantic*, May 20, 1891.

BANISTER, WILLIAM B., *Captain and Assistant Surgeon.*—Is assigned to duty as Medical Officer with Troop "B," Sixth Cavalry, while *en route* from Fort Myer, Va., to Fort Washakie, Wyoming Territory. On arrival of the Troop at its destination, Captain Banister will return to his station at Washington Barracks.—Par. 3, *S. O. 104, Division of the Atlantic*, May 20, 1891.

By direction of the Secretary of War, GEORGE MCCRERY, *Captain and Assistant Surgeon*, is relieved from duty at Fort Clark, Texas, and will report in person to the commanding officer Fort McIntosh, Texas, for duty at that post.—Par. 4, *S. O. 114, A. G. O.*, May 19, 1891.

SKINNER, JOHN O., *Captain and Assistant Surgeon* (Fort Davis, Texas).—Will proceed at once to Fort Clark, Texas, and report to the commanding officer, for temporary duty.—Par. 4, *S. O. 44, Department of Texas*, May 13, 1891.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY FOR THE WEEK ENDING MAY 23, 1891.

BRIGHT, GEORGE A., *Surgeon.*—Detached from the U. S. S. "Omaha," and granted three months' leave of absence.

MEANS, V. C. B., *Passed Assistant Surgeon.*—Detached from the U. S. S. "Omaha," and granted three months' leave of absence.

KEENEY, JAMES F., *Assistant Surgeon.*—Ordered for examination preliminary to promotion to Passed Assistant Surgeon.